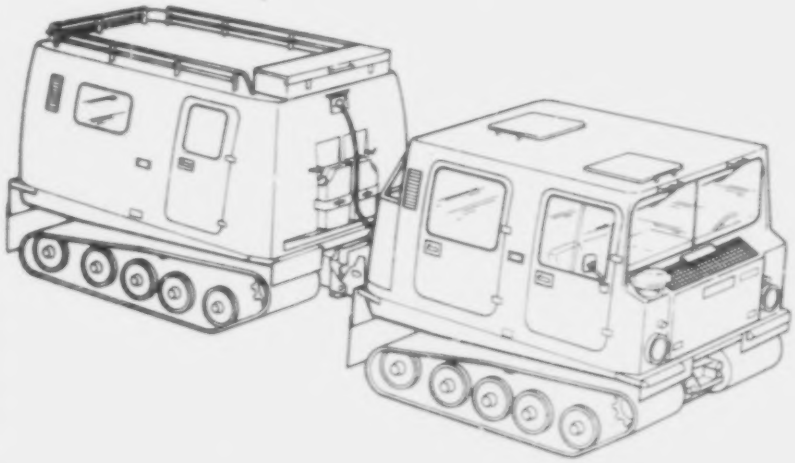
9-2350-272-10

TM 9-2350-272-10

OPERATOR'S MANUAL



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CARRIER, CARGO, TRACKED,
1½ TON, M973
SMALL UNIT SUPPORT VEHICLE (SUSV)
(NSN 2350-01-132-9099)

This copy is a reprint which includes current pages from Change 1

HEADQUARTERS, DEPARTMENT OF THE ARMY
MARCH 1984

D 101.11:

READEX best copy available

WARNING

CARBON MONOXIDE POISONING CAN BE DEADLY

Carbon monoxide is a colorless, odorless, deadly poisonous gas, which, when breathed, deprives the body of oxygen and causes suffocation. Exposure to air containing carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, apparent drowsiness, and coma. Permanent brain damage or death can result from severe exposure.

Carbon monoxide occurs in the exhaust fumes of fuel-burning heaters and internal-combustion engines and becomes dangerously concentrated under conditions of inadequate ventilation. The following precautions must be observed to ensure the safety of personnel whenever the personnel heater or main engine of the vehicle is operated for either maintenance purposes or tactical use.

(1) Do not operate heater or engine of vehicle in an enclosed area unless it is adequately ventilated.
(2) Do not idle engine for long periods without maintaining adequate ventilation in the personnel compartment.
(3) Do not drive the vehicle with inspection plates, cover plates, or access doors removed unless required for maintenance purposes.
(4) Be alert at all times during vehicle operation for exhaust odors and exposure symptoms. If either is present, immediately ventilate personnel compartment. If symptoms persist, remove affected personnel from vehicle and treat as follows: Exposure to fresh air; keep warm; do not permit physical exercise; if necessary administer artificial respiration (FM 21-11).

CLEANING SOLVENT

Cleaning solvent, federal specification P-D-680, Type II, is flammable and gives off harmful vapors. Use solvent only in a well-ventilated area. Avoid prolonged breathing of solvent vapors. Keep solvent away from flame. Do not use solvent in excessive amounts.

NBC CONTAMINATED FILTERS

NBC CONTAMINATED FILTERS MUST BE HANDLED USING ADEQUATE PRECAUTIONS (FM 21-40) AND MUST BE DISPOSED OF BY TRAINED PERSONNEL.

After Nuclear, Biological or Chemical (NBC) exposure of this vehicle all air filters shall be handled with extreme caution. Unprotected personnel may experience injury or death if residual toxic agents or radioactive material are present. If vehicle is exposed to chemical or biological agents, servicing personnel shall wear protective mask, hood, protective overgarments, and chemical protective gloves and boots. All contaminated air filters shall be placed into double lined plastic bags and moved to a segregation area away from the work site swiftly. The same procedure applies for radioactive dust contamination; however, the Company NBC team should measure the radiation prior to filter removal to determine the extent of safety procedures required per the NBC Annex to the unit Standard Operating Procedures (SOP). The segregation area in which the contaminated air filters are temporarily stored shall be marked with appropriate NBC placards. Final disposal of contaminated air filters shall be in accordance with local SOP.

BATTERIES

Do not smoke or have an open flame nearby when checking batteries. Batteries emit gases which are very explosive. Injury to personnel may result. Do not allow battery acid to come in contact with your skin. Serious burns can result.

REMOVING EXPANSION TANK CAP

Do not remove expansion tank cap if temperature gage reads above 160°F (71°C). Serious burns from hot engine coolant may result.

LOOSE OR FRAYED CABLES

Always wear heavy gloves when you handle winch cables. Never let cable run through your hands; frayed cables can cut you.

SEAT BELTS

Use of seat belts while operating your carrier is mandatory as an aid in preventing personal injury in the event of an accident.

HANDLING DIESEL FUEL

When filling the fuel tanks with diesel fuel, be sure the hose nozzle or container contacts the filler tube on the fuel tank to carry off static electricity. DO NOT SMOKE OR PERMIT ANY OPEN FLAME IN THE AREA OF THE CARRIER WHILE YOU ARE SERVICING THE DIESEL FUEL SYSTEM. Failure to follow this warning can result in injury to personnel.

BACKING CARRIER

Make certain area to side and rear of carrier is clear of personnel and objects before attempting to back carrier as serious injury to personnel may result. Use ground guide.

WINCHING

Clear all personnel from vehicle and from the path of cable at a distance equal to the length of the cable. Do not release lock with winch under load. Injury to personnel may result.

TOWING VEHICLE

Do not exceed 12 mph (20 km/h) when towing vehicle with tow cable. Disabled vehicle is difficult to steer. Injury to driver can occur.

SWIMMING

Front and rear cars must be watertight: Cars could sink causing injury to personnel.

CHANGE

No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 17 December 1987

OPERATOR'S MANUAL

CARRIER, CARGO, TRACKED, 1-1/2 TON, M973
SMALL UNIT SUPPORT VEHICLE (SUSV)
(2350-01-132-9099)

TM 9-2350-272-10, dated 15 March 1984 is changed as follows:

1. Remove old pages and insert new pages as indicated below.
2. New or changed material is indicated by a vertical bar in the margin of the page.
3. Added or revised illustrations are indicated by a bar adjacent to the identification number.

Remove Pages	Insert Pages
i and ii	i and ii
1-7 and 1-8	1-7 and 1-8
1-11 and 1-12	1-11 and 1-12
2-1 and 2-2	2-1 and 2-2
2-5 through 2-10	2-5 through 2-10
2-15 through 2-18	2-15 through 2-18
2-41 through 2-44	2-41 through 2-44
3-7 and 3-8	3-7 and 3-8
3-9/ (3-10 blank)	3-9/ (3-10 blank)
B-3 through B-10	B-3 through B-10
E-3 and E-4	E-3 and E-4

4. File this change sheet in front of the publication for reference purposes.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

R.L. DILWORTH
Brigadier General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-37, Unit Maintenance requirements for Carrier, Cargo, Tracked,1 1/2 Ton, Small Unit Support Vehicle (SUSV), M973.

TECHNICAL MANUAL
No. 9-2350-272-10

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 15 March 1984

OPERATOR'S MANUAL
CARRIER, CARGO, TRACKED, 1½ TON, M973
SMALL UNIT SUPPORT VEHICLE (SUSV)
(NSN 2350-01-132-9099)

REPORTING OF ERRORS

You can help improve this publication. If you find any mistakes, or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publication and Blank Forms), or DA Form 2028-2 located in the back of this publication direct to: US Army Tank-Automotive Command ATTN: AMSTA-MB, Warren, MI 48397-5000. A reply will be furnished to you.

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HOW TO USE THIS MANUAL

This manual is designed to help you operate and maintain the M973 cargo carrier and accessory equipment. Listed below are special features which will help you locate the information you need:

- Front cover table of contents for quick reference to chapters and sections.
- An index in the final pages of this manual helps you find specific items of information.

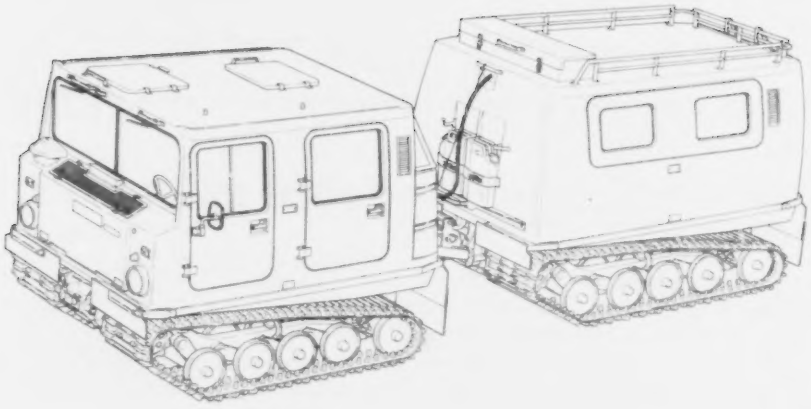
Measurements in this manual are given in both English and Metric units.

- A Metric to English conversion chart is also provided on the inside back cover of this manual.

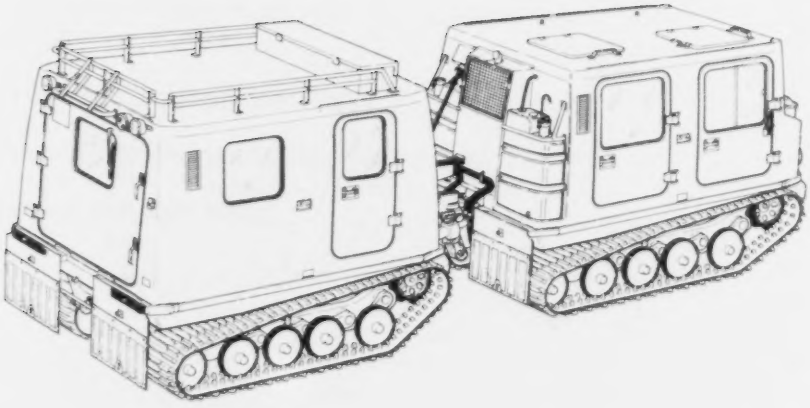
Read all preliminary information found at the beginning of each task. It has important information and safety instructions you must follow before beginning the task.

Warning pages are located in the front of this manual. You should learn the warnings before operating or doing maintenance on the carrier. Important warnings and cautions are also located on other pages in the manual. They appear before a step that may result in personnel injury, or damage to equipment. If the instructions are not followed, or care is not taken, you may injure yourself. Notes are located before or after a step to make the step or steps easier. Always read all cautions, warnings, and notes before performing the steps.

A troubleshooting index is located in chapter III. The troubleshooting index lists the common vehicle malfunctions you may find. Do all tests, inspections and corrective actions in the same order they appear in the troubleshooting table. Report any malfunctions you can not correct to organizational maintenance.



M973, CARGO CARRIER LEFT FRONT VIEW



M973, CARGO CARRIER RIGHT REAR VIEW

Chapter 1
INTRODUCTION

Section I. GENERAL INFORMATION

1-1. SCOPE.

This operator's manual has instructions for operation and maintenance of the M973 cargo carrier. Your manual takes a positive approach. Do the procedures in the same order as in the manual.

1-2. MAINTENANCE FORMS AND RECORDS.

DA PAM 738-750 tells you what forms to complete and how to complete maintenance forms and records.

1-3. METRIC SYSTEM.

Equipment and system is metric. Metric tools are required for equipment maintenance. Metric to English conversion tables are on the inside back cover.

1-4. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR).

If your equipment needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at US ARMY TANK-AUTOMOTIVE COMMAND, ATTN: DRSTA-MP, Warren MI, 48090. We will send you a reply.

1-5. DESTRUCTION TO PREVENT ENEMY USE.

Refer to TM 750-244-6.

Section II. EQUIPMENT DESCRIPTION AND PERFORMANCE DATA

1-6. GENERAL.

The M973 cargo carrier is designed for use as an all terrain transport vehicle. The vehicle has two track-driven cars. Both cars are made of reinforced-fiberglass plastic. They are coupled together by an articulated steering assembly. The cars are steered by hydraulic cylinders in the steering assembly. The front car contains the power pack, (engine and transmission), transfer, braking and steering systems. Both cars have their own differentials. The differentials transmit the power to the track drive sprockets. The cargo carrier has a fording and swimming capability. When swimming, the carrier is propelled by the tracks.

1-7. DESCRIPTION AND LOCATION OF MAJOR COMPONENTS.

a. Description of major components and systems.

(1) Engine: 5 cylinder inline turbocharged diesel, model OM 617.952.

(2) Air cleaner: Dry type.

(3) Fuel system: Engine is fuel injected.

(4) Exhaust system: Engine has a single exhaust.

(5) Cooling system: Engine is liquid cooled.

(6) Electrical system: Vehicle has a 24 volt system.

(7) Transmission: Transmission is automatic 4 speed forward and one reverse.

(8) Transfer: Transfer is a 2 speed type (high and low range)

(9) Differential: Differential is heavy duty high traction type.

(10) Brakes: Vehicle has a hydraulic disk service brake and a mechanical disk parking brake.

(11) Steering: The vehicle is steered by an articulated steering unit. Hydraulic power controls the turning.

(12) Frame: Cars have a center chassis beam.

(13) Suspension: Cars are supported by two leaf springs. The leaf springs are attached from the center chassis beam to track beams. Attached to the track beams are rubber torsion bars, wheel arm and solid rubber wheels.

(14) Carrier body: Carrier body is constructed of reinforced-fiberglass plastic.

(15) Wheels (road, support and tensioning): Cast aluminum with bonded rubber tires.

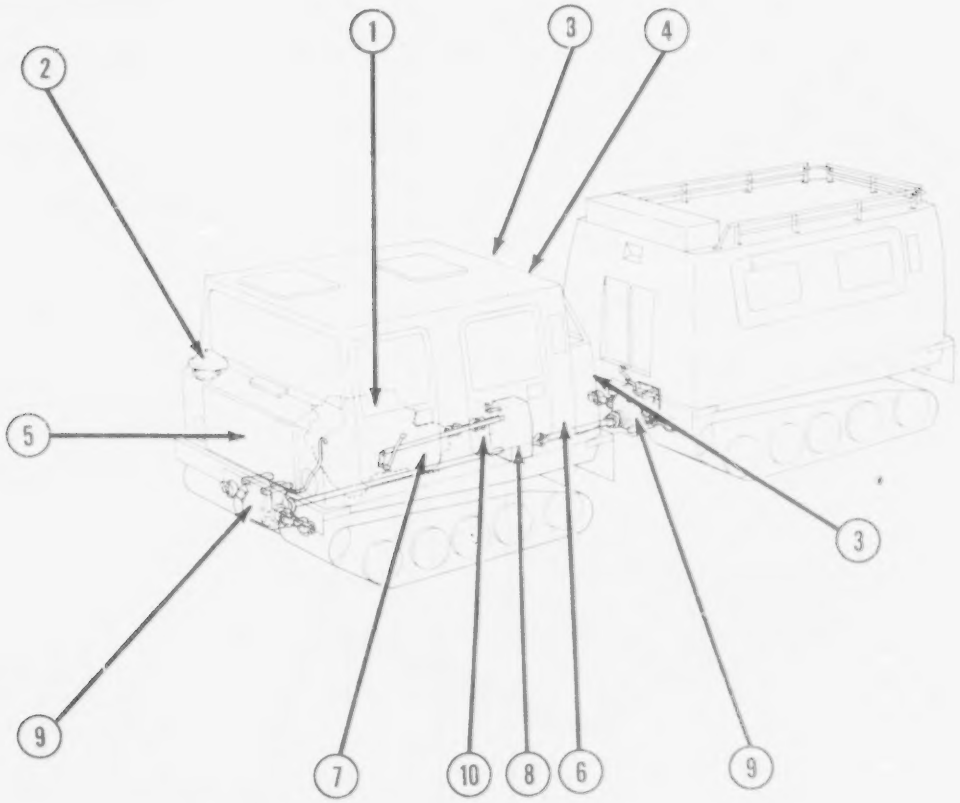
(16) Drive sprocket: Drive sprockets are steel web disks with bonded rubber teeth.

(17) Track: Tracks are corded rubber, reinforced with steel cross members. Guides and tracks are the endless type.

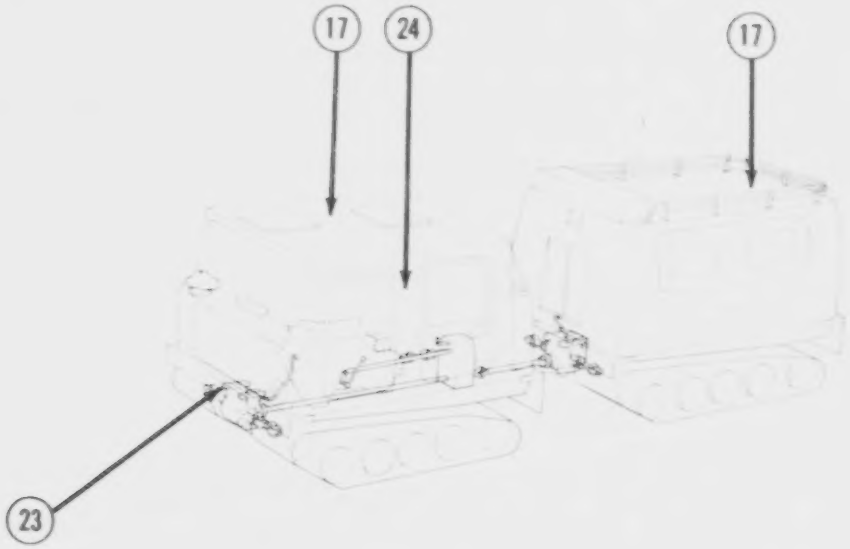
(18) Winch: Winch is electrical. It is detachable from front car and stored inside when not in use.

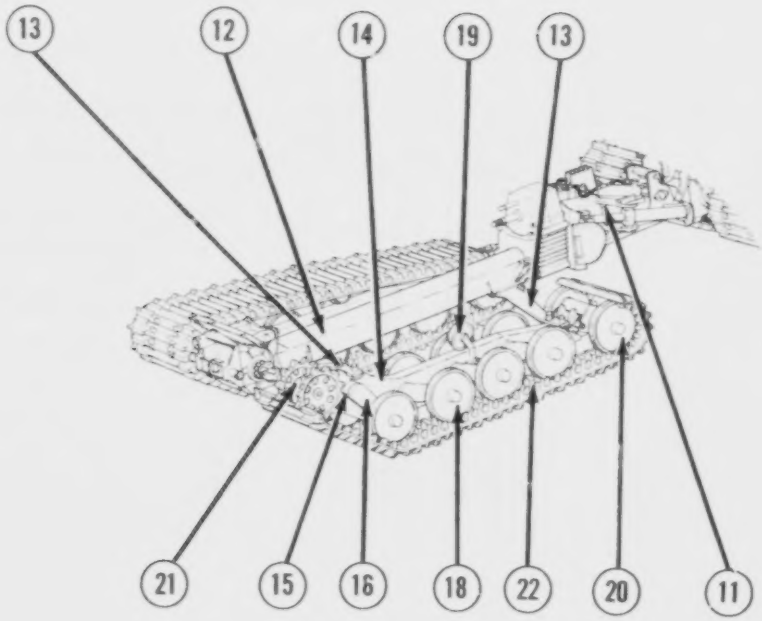
b. Location of Major Components.

(1) Engine
(2) Air Cleaner
(3) Fuel Tanks
(4) Exhaust (Outlet)
(5) Radiator
(6) Batteries
(7) Transmission
(8) Transfer
(9) Differential
(10) Brake Unit



(11) Steering Unit
(12) Chassis Beam
(13) Leaf Spring
(14) Track Beam
(15) Rubber Torsion Bar
(16) Wheel Arm
(17) Car Body
(18) Wheel
(19) Support Wheel
(20) Tensioning Wheel
(21) Drive Sprocket
(22) Track with Guides
(23) Winch Mount
(24) Winch Storage Location





1-8. SPECIFICATIONS AND PERFORMANCE DATA.

Weight: See Table 1-1.

Dimensions: See Table 1-2.

Permissible Fuel: See Table 1-3.

Capacities: See Table 1-4.

Performance Data: See Table 1-5.

TABLE 1-1. WEIGHTS (LBS AND KG)

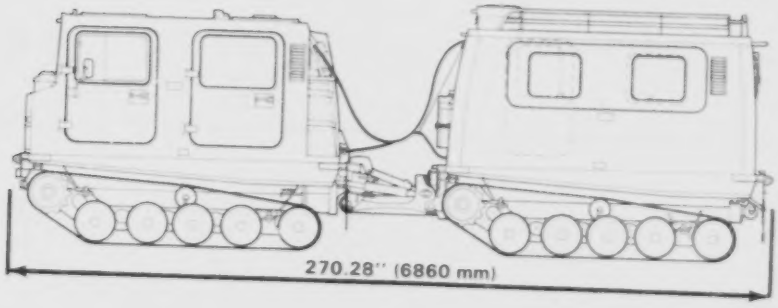
	FRONT CAR	REAR CAR	TOTAL
CURB WEIGHT	6,108 lb (2,770 Kg)*	3,682 lb (1,670 Kg)	9,790 lb (4,440 Kg)*
Maximum Weight Full Load	7,211 lb (3,270 Kg)	6,769 lb (3,070 Kg)	13,980 lb (6340 Kg)
Maximum Payload	1,103 lb (500 Kg)	3,087 lb (1,400 Kg)**	4,190 lb (1,900 Kg)**
Maximum Towed Load	_____	_____	5,513 lb (2,500 Kg)
Ground Pressure, Full Load	_____	_____	1.8 PSI (12.7 kPa)

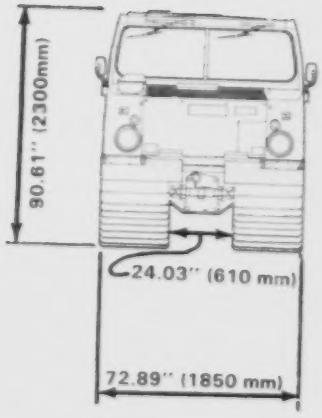
*Includes Operator
**441 lb (200 Kg) secured on roof.

TABLE 1-2. DIMENSIONS

LENGTH OVERALL	HEIGHT OVERALL	WIDTH OVERALL	GROUND CLEARANCE	TRACK WIDTH	WIDTH BETWEEN TRACKS
270.28 in 6860 mm	94.56 in 2400 mm	72.89 in 1850 mm	11.82 in 300 mm	23.43 in 620 mm	24.03 in 610 mm

Doors, front car	
width	32.50 in (825 mm)
height	41.37 in (1050 mm)
Doors, rear car	
side door, width	23.64 in (600 mm)
height	41.37 in (1050 mm)
rear door, width	49.25 in (1250 mm)
height	42.95 in (1090 mm)
Cargo space, front car	88.29 cu ft (2.5 m³)
rear car	194.23 cu ft (5.5 m³)
Tow hook height	19.7 in (500 mm)
Turning radius	26.25 ft (8.0 m)





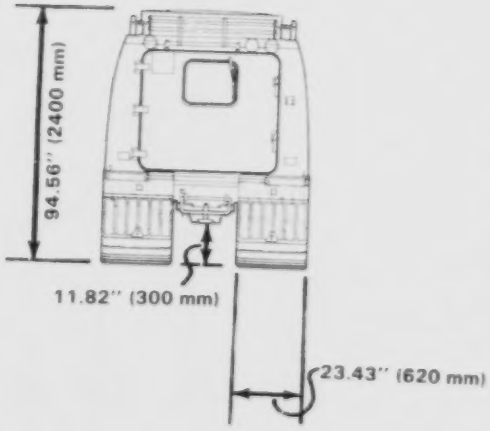


TABLE 1-3. FUELS

TEMPERATURE LIMITS	FUEL
All temperature ranges	Diesel fuel (Grade DFA) (Specification VV-F-800)
Above 32°F (0° C)	Diesel fuel (Grade DF2) (Specification VV-F-800)
-10°F to 32°F (-23°C to 0°C)	Diesel fuel (Grade DF1) (Specification VV-F-800)

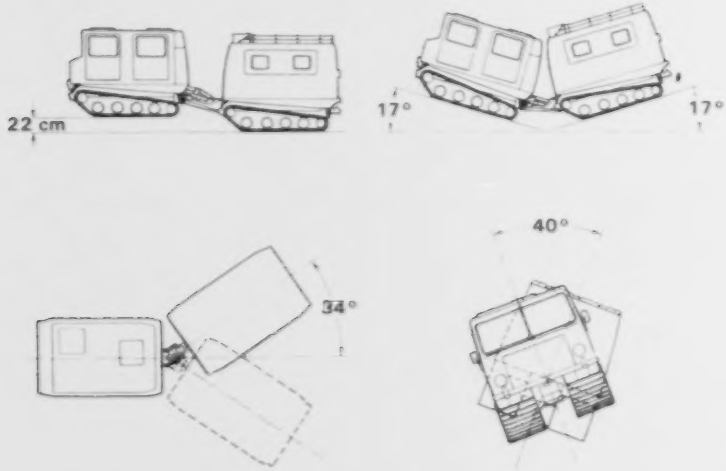
TABLE 1-4. CAPACITIES

Fuel tank, approximate	42.24 Gal (160 liter)
Extra fuel, in cans	10.56 Gal (40 liter)
Cooling system, with heater	26.5 Qt (25 liter)
Windshield washer reservoir	1.05 Gal (4 liter)

TABLE 1-5. PERFORMANCE DATA

Land Performance		
Maximum Forward Speed	31 mph	(50 km/h)
gradeability, hard surface	60%	(31°)
deep snow	30%	(17°)
side slope minimum	40%	(22°)
Water Performance		
Maximum Swimming Speed	2 mph	(3 km/h)

Steering and Approach Angles



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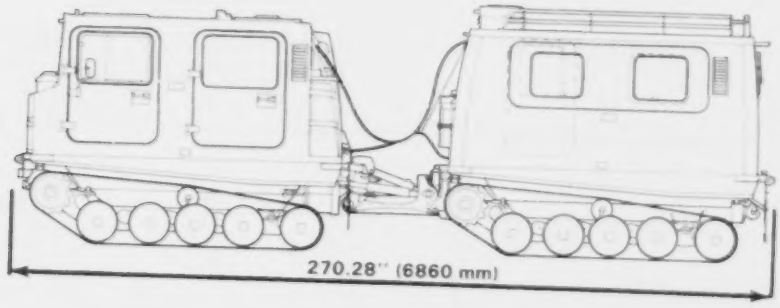
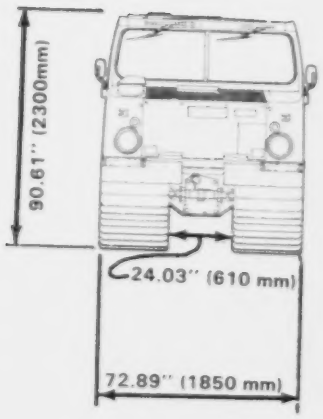
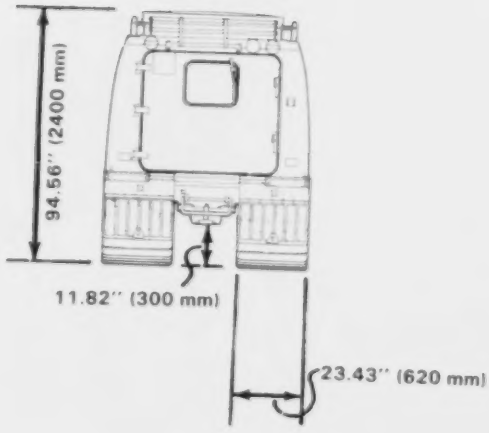
Doors, front car
- width . . . . . 32.50 in (825 mm)
- height . . . . . 41.37 in (1050 mm)

Doors, rear car
- side door, width . . . . . 23.64 in (600 mm)
- height . . . . . 41.37 in (1050 mm)
- rear door, width . . . . . 49.25 in (1250 mm)
- height . . . . . 42.95 in (1090 mm)

Cargo space, front car . . . . . 88.29 cu ft (2.5 m³)
rear car . . . . . 194.23 cu ft (5.5 m³)
Tow hook height . . . . . 19.7 in (500 mm)
Turning radius . . . . . 26.25 ft (8.0 m)







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Maximum Forward Speed	31 mph	(50 km/h)
gradeability, hard surface	60%	(31°)
deep snow	30%	(17°)
side slope minimum	40%	(22°)
Water Performance		
Maximum Swimming Speed	2 mph	(3 km/h)

Steering and Approach Angles

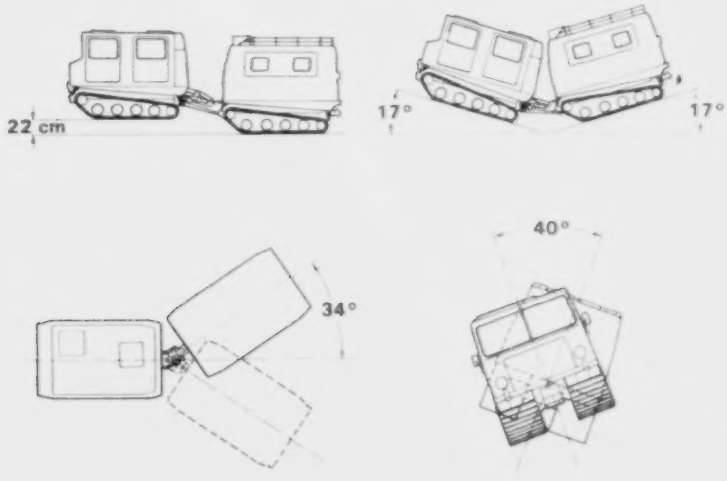


TABLE 1-5. PERFORMANCE DATA (CONT.)

Engine

Make . . . . . Mercedes-Ben
Model . . . . . OM 617.952
Type . . . . . Four stroke, in-line turbocharged, diesel, fuel injection, liquid cooled
Cylinders 5
Maximum brake horse power . . . . . 125 at 4350 RPM
Firing order 1-2-4-5-3
Cooling system . . . . . closed, with expansion tank
Normal operating temperature 176-202°F (80-95°C)
Lubrication . . . . . forced-circulation with thermostat-controlled air-cooled oil cooler
Air cleaner . . . . . dry type

Electrical System

Voltage . . . . . 24 volts
Alternator capacity . . . . . 55 amps
Fuses/rating . . . . . 17/8 amps
Batteries 2
Voltage (Each Battery) . . . . . 12 volts
Connection . . . . . series
Capacity . . . . . 88 amp

Lamps/Lights

Description	Quantity	Rating	Type
Headlamps			
high beam/low beam	2	55/50 W	P 45 t
parking lights	2	4 W	BA 9 s
Direction indicators, front	2	18 W	SV 8.5
Blackout lights	2	15 W	SV 8.5
Side marker lights	4	5 W	SV 8.5
Combination rear lights			
directional indicators	2	21 W	BA 15 s
brake light	2	21 W	BA 15 s
rear light	2	10 W	BA 15 s
brake light, blackout	2	3 W	SV 5.5
rear light, blackout	2	3 W	SV 5.5
Backup light	1	21 W	BA 15 s
Number plate light	1	5 W	SV 8.5
Cabin lights	4	10 W	SV 8.5
Map light	1	5 W	SV 8.5
Gear selection light	2	2 W	BA 9 s

Indicator Lights

Direction indicators,			
Carrier	1	2 W	BA 9 s
Towed vehicle	1	2 W	BA 9 s
High beam	1	2 W	BA 9 s
Temperature, automatic gearbox	1	2 W	BA 9 s
Oil pressure	1	2 W	BA 9 s
Parking brake/brake circuits	1	2 W	BA 9 s
Bilge pumps	1	2 W	BA 9 s
Battery charging	1	2 W	BA 9 s
Intercom	1	2 W	BA 9 s

TABLE 1-5. PERFORMANCE DATA (CONT.)

Lamps/Lights Description	Quantity	Rating	Type
Instrument Lights			
Fuel gage	1	2 W	BA 9 s
Coolant Temperature	1	2 W	BA 9 s
Speedometer/odometer	1	4 W	BA 9 s
Tachometer	1	2 W	BA 9 s

Transmission

Make	Mercedes-Benz
Model	W 4 A-018
Type	Automatic
Number of Speeds	
Forward	4
Reverse	1

Gear	Maximum Speed in Each Gear High Range	Low Range
1	8 mph (13 kph)	4 mph (7 kph)
2	14 mph (22 kph)	8 mph (13 kph)
3	22 mph (35 kph)	14 mph (22 kph)
4	31 mph (50 kph)	19 mph (31 kph)
R	5 mph (8 kph)	3 mph (5 kph)

Transfer Case

Make	Hagglunds
Type	Manual
Number of ranges	2
Maximum speed each range	
High	31 mph (50 kph)
Low	19 mph (31 kph)

Differentials

Make	Hagglunds
Gear ratio	4.75:1

Brake System

Service	Hydraulic disk brake
Brake pedal free play	0.19"-0.79" (5-20 mm)
Parking	Mechanical disk brake

Steering system

Type	Articulated, hydraulic
Hydraulic pump	Bosch
Steering valve	ZF
Pressure filter	Pall
Servo valve	ZF
Steering cylinders, two each	Hiab-Foco
Damping cylinder	Mecman
Steering wheel turns, lock-to-lock	
normal steering[1])	approximately 4.5
emergency steering	approximately 15

[1]Engine speed approximately 2000 rpm

TABLE 1-5. PERFORMANCE DATA (CONT.)

Track equipment	
Tracks, make	
quantity	Skeg
type	
track guides	Endless
Driving sprocket pairs	12
teeth per sprocket	
Wheels	12
Tensioning wheels	32
Support wheel	8
	4
Body	
Front and rear car	Reinforced fibreglass plastic material
Heater, with fan and motor	
make	Blackstone
type	Direct air heater
quantity	One per car
heat capacity	
front car	36,800 BTU (10,000 kcal/h)
rear car	22,080 BTU (6000 kcal/h)
Tow hook	
Type	manual release
Towing eyes	
Quantity	2 front, 2 rear
Winch	
Type	Electric
Quantity	1
Voltage	24 volts
Drive	planetary
Load capacity	2.5 tons
Wire rope cable	171-strand with steel core
diameter	5/16 in (8 mm)
length	98.5 ft (30 m)

1-9. PRINCIPLES OF OPERATION.

a. Engine.

The engine operates on a four-stroke precombustion chamber diesel engine principle, with a turbocharger and waste-gate pressure regulating valve. Glow plugs on the engine pre-heat the incoming air. This provides a more efficient combustion for cold weather starting. The engine is lubricated by a forced-circulation system. The lubrication system has a thermostat-controlled, air-cooled oil cooler. The engine is liquid cooled. An arctic heater warms the engine coolant in very cold weather.

b. Drive train.

The transmission is automatic with four speeds forward and one reverse. The transfer is a two-speed unit driven by the transmission. It distributes power to the front and rear car differentials. Drive shafts then carry power to the drive sprockets to propel the tracks.

c. Brakes.

The carrier has two independent brake systems. Service brake hydraulically operates a brake caliper mounted on the brake shaft near the transfer. Parking brake mechanically operates the same brake disk as the service brake. When the service brake is applied the parking brake self adjusts. The calipers adjust automatically to wear.

d. Suspension.

Two leaf springs support the car and track beams. The track beam holds wheels and tracks to move the car.

e. Electrical system.

Provides engine starting and controls all electrical equipment. The electrical system is protected by fuses. A thermostat controls a heater plate to warm the batteries.

f. Steering system.

The front car has a hydraulically controlled steering system. The steering wheel operates a steering valve. This valve controls a servo valve, which allows oil from a hydraulic pump to move steering cylinders mounted between the cars. An emergency steering system is provided through the servo valve in the event of hydraulic pump failure.

g. Auxiliary automotive systems.

Provide bilge pumps, fuel tanks, heating and ventilation.

h. Carrier bodies.

Supports all systems, except the suspension.

i. Fording and swimming.

The carrier can ford and swim with proper preparation.

j. Recovery.

All carriers have an electrical recovery winch, which mounts on the front car.

Chapter 2
OPERATING INSTRUCTIONS

Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

This section shows the location and describes the function and use of controls and indicators you will use in operating your cargo carrier.

2-1. KNOW YOUR CONTROLS AND INDICATORS.

The operator must know the location and function of every control and indicator before operating the carrier and its equipment. A proper understanding of the carrier's operations and functions will increase the safe use of the vehicle.

2-2. CHASSIS CONTROLS AND INDICATORS.

a. Instrument clusters.

(1) Transmission oil temperature indicator when lit RED shows high transmission oil temperature.

(2) Vehicle directional signal indicator when lit GREEN shows carrier's signal lights operating.

(3) Engine oil pressure indicator when lit RED shows low engine oil pressure.

(4) Trailer turn signal indicator when lit GREEN shows trailer signal lights operating.

(5) Hydraulic brake circuits/parking brake indicator when lit RED shows nonoperational hydraulic brake circuit or shows parking brake applied.

(6) High beam indicator when lit BLUE shows headlamp high beams are on.

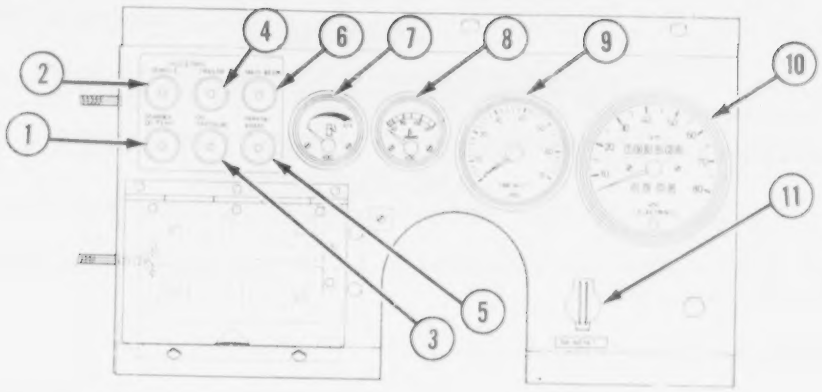
(7) Fuel gage — shows fuel level in tanks.

(8) Engine coolant temperature gage — shows engine coolant temperature.

(9) Tachometer — shows engine RPM.

(10) Speedometer — shows vehicle speed.

(11) Light socket — 24 volt light socket.



b. Control panel.

(1) Ignition switch. Turns on electrical system. Starts the engine.

(2) Battery heater indicator when lit YELLOW shows battery heater operating.

(3) Glow plug/engine stop switch — turns on glow plugs for preheating engine. Shuts off the engine.

(4) Coolant circulating pump switch — operates the engine heater coolant circulating pump.

(5) Light switch — operates vehicle lights.

(6) Bilge pump switch — operates front and rear car bilge pumps.

(7) Instrument panel rheostat — used to adjust instrument panel lighting.

(8) Bilge pump indicator when lit YELLOW shows bilge pumps operating.

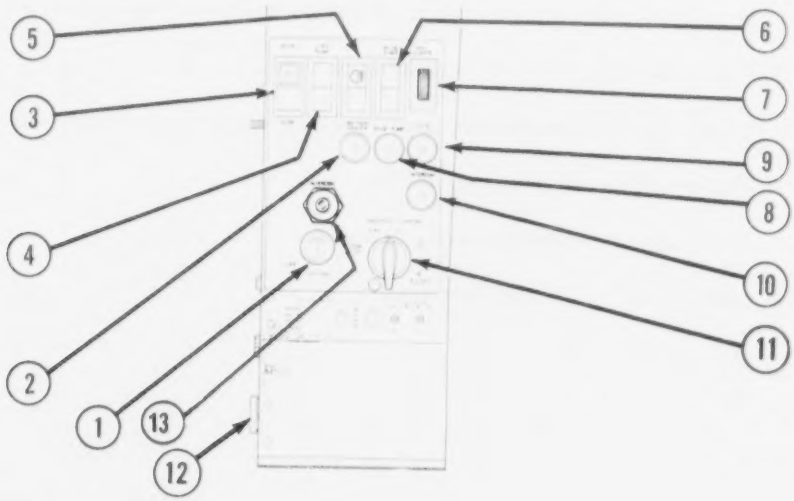
(9) Battery indicator when lit RED shows battery discharge.

(10) Intercom indicator when lit YELLOW shows intercom operating from rear car.

(11) Blackout light switch — Operates vehicle blackout lights.

(12) Rear car warning buzzer — use to contact driver from rear car.

(13) Intercom switch — operates intercom between cars.



c. Directional signal switch.

(1) Directional signal switch has the following functions:

Operates turn signals.

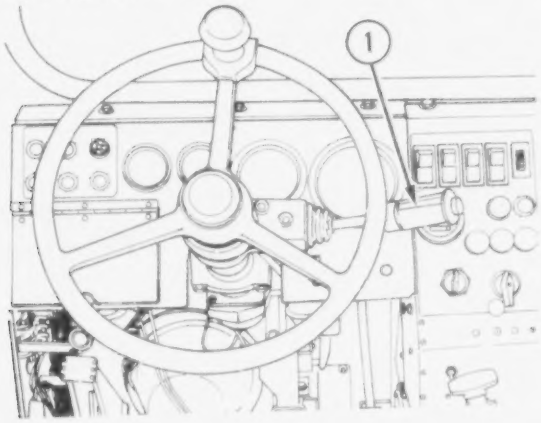
Operates high and low headlamp beams.

Operates horn.

Operates high beam headlamp signalling.

Operates windshield wipers.

Operates windshield washer.



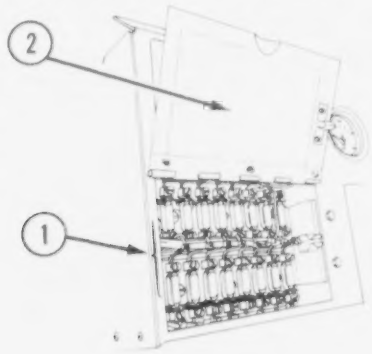
d. Fuse boxes and data plates.

NOTE

Fuse boxes are located in the lower left corner of the instrument panel and under drivers seat.

(1) Fuses — used to protect the electrical system from overload.

(2) Data plate — Identifies fuse location and function.



e. Other cab controls.

(1) Steering wheel knob — use to assist in steering.

(2) Window handle — use to control window.

(3) Door lock — secures door.

(4) Gear shift lever — use to select gears in the automatic transmission.

(5) Hand throttle — use to adjust engine speed.

(6) Transfer shift lever — use to select ranges in transfer.

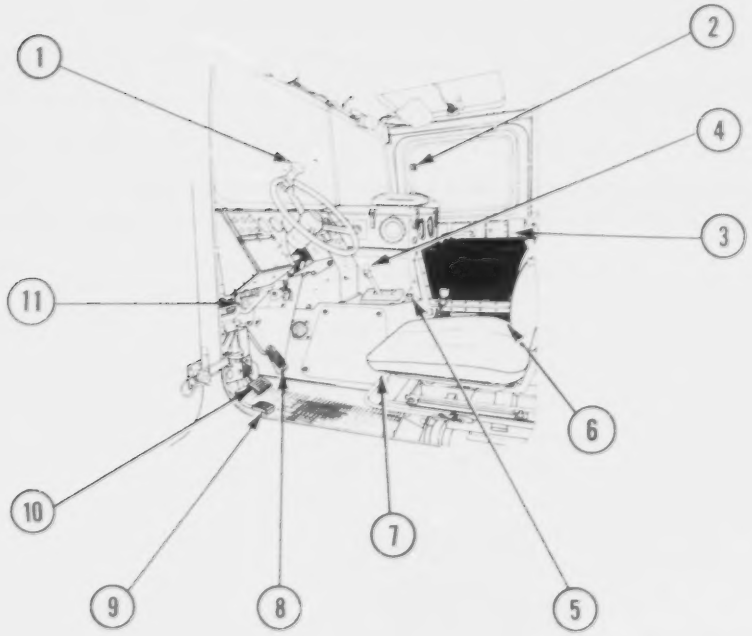
(7) Hand lever — permits forward or rear adjustments of the seat.

(8) Accelerator pedal — controls engine speed.

(9) Parking brake pedal — engages parking brake.

(10) Brake pedal — engages service brakes.

(11) Parking brake release knob — disengages parking brake.



f. Front car heater.

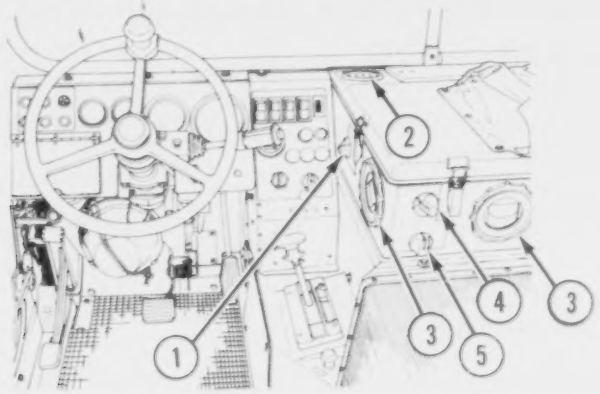
(1) Heater air flow control — directs air to car passenger compartment and windshield defroster ducts.

(2) Defroster deflector — directs air onto windshield.

(3) Air vents — directs air to car passenger compartment.

(4) Heater fan switch — Turns on heater fan.

(5) Heat temperature control — raises and lowers temperature.



g. Rear car heater and switch panel. (Inside Rear Car)

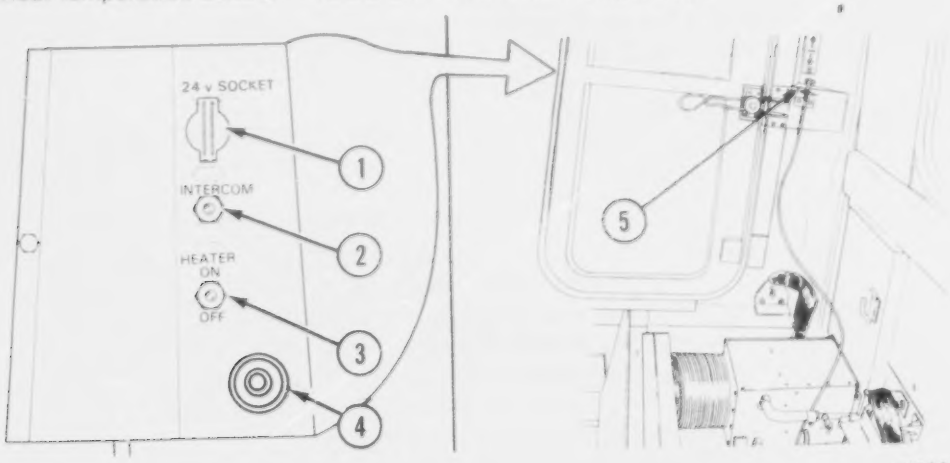
(1) Socket — 24 volt power socket.

(2) Intercom switch — operates intercom between cars.

(3) Heater fan switch — turns on heater fan.

(4) Front car warning buzzer — used to contact personnel from front car.

(5) Heat temperature control — raises and lowers heat temperature.



Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-3. GENERAL.

a. Maintenance forms and records.

Every mission begins and ends with the paper work. There isn't much of it, but you have to keep it up. The forms and records you fill out have several uses; they are a permanent record of the services, repairs, and modifications made on your vehice; they are reports to Organizational Maintenance and to your Commander; and they are a checklist for you when you want to know what is wrong with the vehicle after its last use, and whether those faults have been fixed. For the information you need on forms and records, see DA PAM 738-750.

b. Preventive Maintenance Checks and Services (Table 2-1).

(1) Do your before (B) PREVENTIVE MAINTENANCE just before you operate your vehicle. Pay attention to the CAUTIONS AND WARNINGS.

(2) Do your during (D) PREVENTIVE MAINTENANCE while the vehicle and/or its component systems are in operation.

(3) Do your after (A) PREVENTIVE MAINTENANCE right after operating the vehicle. Pay attention to the CAUTIONS AND WARNINGS

(4) Do your weekly (W) PREVENTIVE MAINTENANCE weekly.

(5) Do your monthly (M) PREVENTIVE MAINTENANCE once a month or every 500 miles (804 Km

(6) If something doesn't work, troubleshoot it with the instructions in this manual and notify your supervisor.

(7) Always do your PREVENTIVE MAINTENANCE in the same order until it gets to be a habit. Once you've had some practice, you'll spot anything wrong in a hurry.

(8) If anything looks wrong and you can't fix it, write it on your DA Form 2404. If you find something seriously wrong, report it to Organizational Maintenance RIGHT NOW.

(9) When you do your PREVENTIVE MAINTENANCE, take along the tools you need to make all the checks. You always need a rag or two.

c. General maintenance procedures.

WARNING

Cleaning solvent, federal specification P-D-680, Type II is flammable and gives off harmful vapors. Use solvent only in a well-ventilated area. Avoid prolonged breathing of solvent vapors. Keep solvent away from flame. Do not use solvent in excessive amounts.

(1) Cleanliness.

Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Clean as you work and as needed. Use dry cleaning solvent on all metal surfaces. Use soap and water when you clean rubber or plastic material.

(2) Bolts, nuts and screws.

Check them all for obvious looseness, missing, bent or broken condition. You can't try them all with a tool, or course, but look for chipped paint, bare metal, or rust around bolt heads. If you find one you think is loose, tighten it, or report it to Organizational Maintenance if you can't tighten it.

(3) Welds.

Look for loose or chipped paint, rust, or gaps where parts are welded together. If your find a bad weld, report it to Organizational Maintenance.

(4) Electric wires and connectors.

Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors and make sure the wires are in good shape.

(5) Hoses and fluid lines.

Look for damage and leaks. Make sure clamps and fittings are tight. Wet spots show leaks, of course, but a stain around a fitting or connector can mean a leak. If a leak comes from a loose fitting or connector, tighten it. If something is broken or worn out, report it to Organizational Maintenance.

(6) Fluid leakage.

It is necessary for you to know how fluid leakage affects the status of your vehicle. The following are definitions of the types/classes of leakage you need to know to be able to determine the status of your vehicle. Learn, then to be familiar with them and REMEMBER -- WHEN IN DOUBT, NOTIFY YOUR SUPERVISOR.

Leakage definitions for crew/operator PMCS:

Class I -- Seepage of fluid (as indicated by wetness or discoloration) but not great enough to form drops.

Class II -- Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.

Class III -- Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

CAUTION

Equipment operation is allowable with minor leakage (Class I or II). Report all Class III leaks to your supervisor immediately. Of course, consideration must be given to the fluid capacity in the item/system being checked/inspected. When in doubt, notify your supervisor.

TABLE 2-1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B-BEFORE D-DURING A-AFTER W-WEEKLY M-MONTHLY

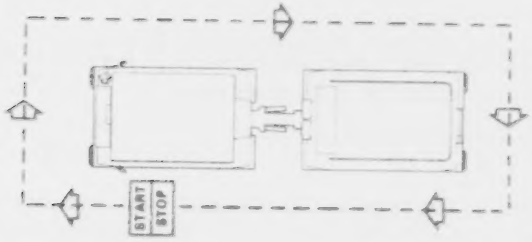
ITEM NO.	INTERNAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
						NOTE Perform WEEKLY (W) as well as BEFORE (B) PMCS if: (1) you are the assigned operator but have not operated the vehicle since the last weekly PMCS: or (2) you are operating the vehicle for the first time. MAKE THE FOLLOWING WALK-AROUND CHECKS following the route shown below.	
							
1						EXTERIOR	
	•					a. Visually check FRONT AND REAR CAR BODY for damage that would impair operation.	Vehicle damage which impairs operation, such as FORDING AND SWIMMING THE CARGO CARRIER.
	•					b. Check under vehicle for fluid leaks.	Class III leakage.
		•				c. Check condition of: (1) Mirrors	
		•				(2) Windshield	
		•				(3) Windshield wiper arms and blades	
	•					(4) Door seals	Door seal damage which will impair fording and swimming operation.
		•				(5) Sliding door and cargo carrier windows	
				•		(6) All locking and fastening devices	
	•					(7) Reflectors	
	•					d. Check operation of all exterior lights.	

TABLE 2-1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B-BEFORE D-DURING A-AFTER W-WEEKLY M-MONTHLY

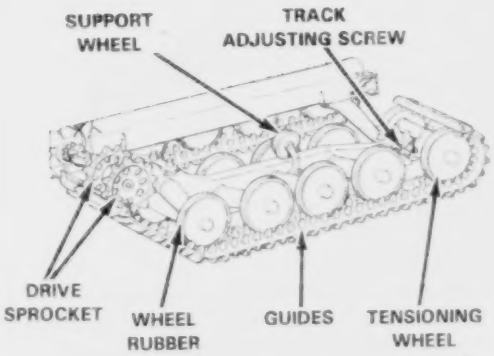
ITEM NO.	INTERNAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
2						SUSPENSION SYSTEM	
	•					a. Check for broken torsion bars by attempting to PRY UP on wheel arms.	Torsion bar broken
	•		•			b. Check wheels, drive sprocket, tensioning wheel, support wheel and adjusting screw, for damage, loose mountings, rubber separation, and chunking of tires. 	Wheels are missing or have loose mountings. Track adjusting screw mechanism missing/ unserviceable. Tensioning wheel loose. Roadwheel arms bent, damaged, or have loose mounting. Broken or missing drive sprocket rubber tips or loose sprocket mounting. Rubber separation or chunking of wheels which equal up to half way around the wheel.
	•		•			c. Check tracks for correct adjustment, missing or damaged guide horns, through cracks or tears and exposed or damaged metal rods. NOTE Cracks that are located outside of the guide horns are permissible. A through crack is a crack in the rubber track that goes all the way through the rubber. If you can see through the crack the track is unserviceable.	Tracks out of adjustment missing or damaged guide horns or support wheel. Through cracks or tears that extend to sprocket wheel guide holes or tears that extend to sprocket wheel guide holes or through three nylon cords. Metal rods exposed on three or more adjacent groucers, or metal rods coming in contact with the road's surface. A broken or cracked metal rod.
3					•	Clean and apply grease at all grease points. Refer to LO 9-2350-272-12 for location of grease points.	

TABLE 2-1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B-BEFORE D-DURING A-AFTER W-WEEKLY M-MONTHLY

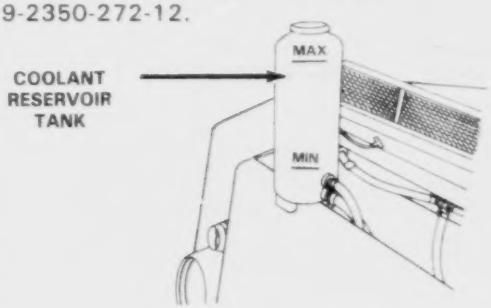
ITEM NO.	INTERNAL					ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M		
4	•					Remove front car grille plastic cover. Open grille. Check fluid level of steering hydraulic fluid tank. Correct level is between max and min marks. Add fluid as necessary. Refer to LO 9-2350-272-12 for proper fluid.	
5	•					Check coolant reservoir tank level. Coolant should be between the max and min marks. Add coolant as necessary. Refer to LO 9-2350-272-12. 	
6	•		•			Check the radiator compartment for fluid leaks and debris. Install front car grille cover.	Class III fluid leaks and debris.
7						DIFFERENTIALS	
					•	a. Check front and rear differential oil level. Refer to LO 9-2350-272-12. Fill as necessary.	
			•			b. After swimming carrier check differentials for water contamination. If water is found in differential notify organizational maintenance.	Water in gear box.
8						TRANSFER	
					•	a. Check transfer oil level. Refer to LO 9-2350-272-12. Fill as necessary.	
			•			b. After swimming carrier check transfer for water contamination. If water is found in transfer notify organizational maintenance.	Water in transfer.

TABLE 2-1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B-BEFORE D-DURING A-AFTER W-WEEKLY M-MONTHLY

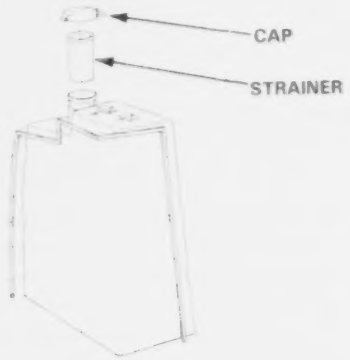
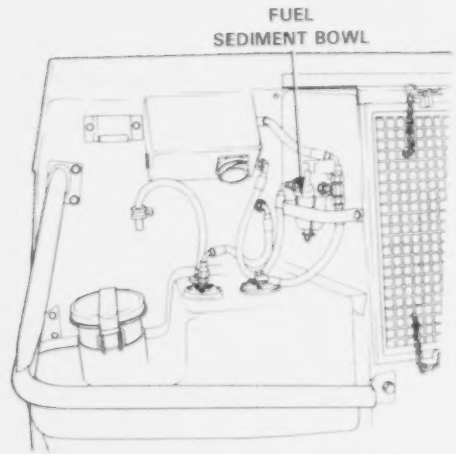
ITEM NO.	INTERNAL					ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M		
9						FUEL TANKS, CAP AND STRAINER	
					•	a. Check fuel tank cap for missing or damaged gasket.	
					•	b. Check fuel tank strainer for damage or debris.	
							
	•					c. Check fuel sediment bowl for water or other foreign matter. Notify organizational maintenance if found.	Water or foreign matter found in sediment bowl.
							
10	•					Check fuel system for fluid leaks.	Class I, II, or III leaks.

TABLE 2-1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B-BEFORE D-DURING A-AFTER W-WEEKLY M-MONTHLY

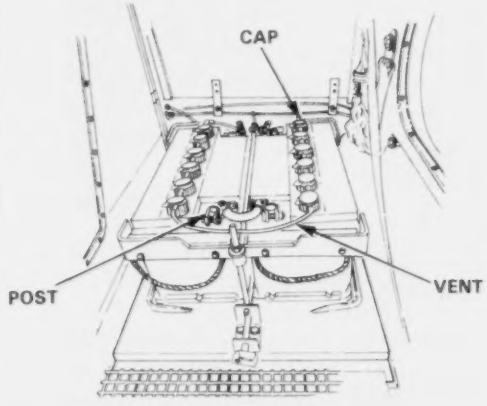
ITEM NO.	INTERNAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
11						BATTERIES *WARNING* Do not smoke or have an open flame nearby when checking batteries. Batteries emit gases which are very explosive. Injury to personnel may result. Do not allow battery acid to come in contact with your skin. Serious burns can result. Remove battery box cover.	
				•		a. Check vent tubes for kinks or damage.	
				•		b. Remove caps. Check electrolyte level in all battery cells. Correct level is lower edge of filler bore. Notify organizational maintenance if level is low. If authorized fill batteries with distilled water, if level is low. Run engine for 10-15 minutes to allow electrolyte and water to mix.	
				•		c. Visually check batteries for cracked or leaking casing and corrosion around the posts. Report damage to organizational maintenance.	Batteries unserviceable, missing or do not crank engine.
				•		d. Check cable and post clamp bolts and nuts for tightness. Notify organizational maintenance if loose. If authorized tighten all loose hardware.	
							
						Replace battery box cover.	

TABLE 2-1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B-BEFORE D-DURING A-AFTER W-WEEKLY M-MONTHLY

ITEM NO.	INTERNAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
12						POWER PACK COMPARTMENT CAUTION Do not over fill engine. Damage to engine may result if oil level is above full mark. NOTE Check oil level with engine off and the vehicle on level ground. If engine has been running, wait five minutes before checking level. If oil level is above the min mark when engine is COLD, DO NOT add oil. If level is below the min mark add oil as necessary. Refer to LO 9-2350-272-12. Remove engine hood.	
	•					a. Pull out engine oil dipstick, check oil level. Correct level is between marks.	Engine oil level above full mark. Notify organizational maintenance.
	•					b. Check engine compartment for fluid leaks, water collection or ice.	Class III fluid leak. Ice prevents operation of power pack components.
				•		c. Remove right side access cover. Check tension of V-belts for proper deflection: **NOTE** Measurement is taken midway between pullies.	

TABLE 2-1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B-BEFORE D-DURING A-AFTER W-WEEKLY M-MONTHLY

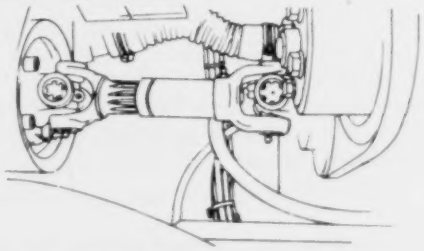
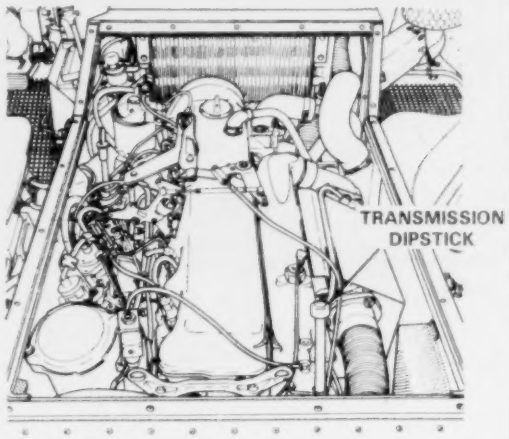
ITEM NO.	INTERNAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
						V-belt — Deflection Fan and hydraulic pump — 3/8" (10 mm) Alternator — 1/4" (5 mm) Water pump — 3/8" (10 mm) Notify organizational maintenance if belts need adjusting.	
							
				•		d. Check belts for cracks, fraying and breaks. Replace access cover.	Belts cracked, frayed, broken or missing.
						WARNING Carbon monoxide poisoning can be deadly.	
	•					e. Check engine hood and covers seals for cracks, fraying and breaks.	Seal cracked, frayed, broken or missing.
	•					f. Check and fill transmission oil level as necessary. Refer to LO 9-2350-272-12.	
							
						Replace engine hood.	

TABLE 2-1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B-BEFORE D-DURING A-AFTER W-WEEKLY M-MONTHLY

ITEM NO.	INTERNAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
13	•					Check windshield washer reservoir fluid level. Refer to LO 9-2350-272-12.	
14	•					Check brake master cylinder reservoir. Refer to LO 9-2350-272-12.	
15	•					Check inside rear car for fluid leaks.	
16						INSTRUMENTS, WARNING LIGHTS AND CONTROLS Start engine, refer to paragraph 2-5.	
						a. Check operation of the following gages:	
		•				(1) Fuel level gage — should show fuel level in tanks.	
		•				(2) Engine coolant temperature gage — should remain between 176-202°F (80-95°C) when engine is warmed up.	Gage reads above 202°F (95°C).
		•				(3) Tachometer — should read 750-850	
						b. Check warning lights for obvious damage. After starting engine check operation of the following:	
		•				(1) Transmission oil temperature indicator — should not be lit.	Transmission oil temperature indicator lights.
		•				(2) Turn signal indicator — check for operation.	
		•				(3) Engine oil pressure indicator — should go out when engine has started.	Engine oil pressure indicator stays on.
		•				(4) Hydraulic brake circuits/parking brake indicator — should go out when parking brake is released and should not light when service brake pedal is applied.	Light remains lit after parking brake is released. Light comes on when service brake pedal is applied.
		•				(5) Deleted	
		•				(6) Speedometer — check for operation.	

TABLE 2-1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B-BEFORE D-DURING A-AFTER W-WEEKLY M-MONTHLY

ITEM NO.	INTERNAL					ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M		
		•				(7) Bilge pump indicator — check for operation.	Light does not come on when bilge pump switch is turned on.
		•				(8) Battery indicator — should go out after engine starts.	Battery indicator stays on.
		•					
		•				c. Deleted	
		•				d. Check operation of horn.	
		•				e. Check operation of windshield wipers and washer.	
17						ENGINE	
						Check engine for:	
		•				a. Unusual noise or vibration.	Engine inoperative, unusual noise or vibration.
		•				b. Excessive exhaust smoke.	
		•				c. Rough idle.	
		•				d. Hard starting.	
		•				e. Lack of power.	
18						STEERING	
						Check Steering for:	
		•				a. Pulling to one side.	Steering inoperative, steering pulls and unusual noise.
		•				b. Hard turning.	
		•				c. Unusual noise while turning.	
	•		•			d. Packed snow, ice, or debris in steering unit.	Packed snow, ice or debris.
19						SERVICE BRAKES	
						Check service brakes for:	
		•				a. Vibration.	Service brakes do not operate properly.
		•				b. Unusual noise.	
		•				c. Stopping ability.	

TABLE 2-1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B-BEFORE D-DURING A-AFTER W-WEEKLY M-MONTHLY

ITEM NO	INTERNAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
20						TRANSMISSION	
						Check transmission for:	
		•				a. Slippage.	Transmission slips, rough shifting, unusual noise, or inoperative.
		•				b. Rough shifting.	
		•				c. Unusual noise.	
21						PARKING BRAKE	
				•		Check parking brake for proper operation.	Parking brake is nonoperational.
22						INTERVEHICULAR CABLE AND HOSES	
				•		a. Check cable for cracks, breaks and other damage.	
				•		b. Check hoses for damage, deterioration, and leakage.	Damaged or leaking.
23						WINCH	
		•				a. Check remote control for proper operation.	
						b. Inspect remote control and power cable for damage.	
		•				c. Check winch for leaks, kinked, frayed or damaged cable.	
24						ENGINE HEATER	
		•				a. Check engine heater coolant circulating pump for operation.	
		•				b. Check hoses and connections for leaks and damage.	
		•				c. Check engine heater unit for leaks and damage.	
		•				d. Check blow torch for proper operation.	

TABLE 2-1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B-BEFORE D-DURING A-AFTER W-WEEKLY M-MONTHLY

ITEM NO.	INTERNAL					ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED OR ADJUSTED AS NEEDED	EQUIPMENTIS NOT READY/AVALABLE IF:
	B	D	A	W	M		
25						FIRE EXTINGUISHERS	
				•		a. Check that seal on fire extinguisher handle is not broken or missing.	Seal broken or missing
				•		b. Check that gage shows full charge if applicable.	Extinguisher discharged.
				•		c. Check for damage to handle or gage if applicable.	Damage handle or gage.

Section III. OPERATION UNDER USUAL CONDITIONS

2-4. GENERAL INFORMATION.

Section III gives instructions for operating the vehicle under normal temperature and terrain conditions. Instructions for operating vehicle under unusual conditions are in Section IV.

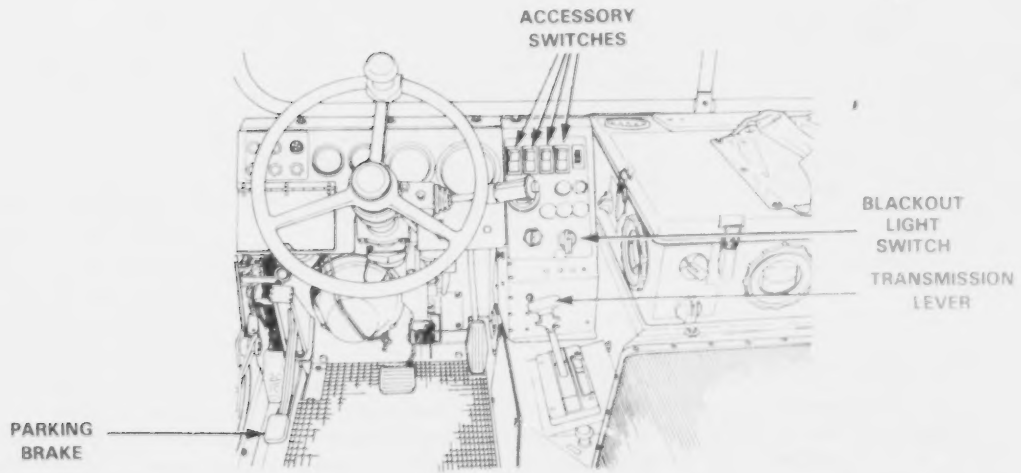
2-5. STARTING ENGINE.

a. Before starting.

WARNING

Always wear ear plugs or other types of hearing protection while engine is operating. Damage to hearing will occur without protection.

Step 1. Before starting engine or operating vehicle, perform the before operation preventive maintenance checks and services. Refer to Table 2-1.
Step 2. Remove front and rear grille covers.
Step 3. If drain plugs are removed, install front and rear.
Step 4. Adjust the seat. Seat adjustment lever is on the front and left side of the seat.
Step 5. Adjust mirrors.
Step 6. Adjust and fasten seat belts. Crew and passengers must also wear seat belts. Apply parking brake. Press on parking brake pedal firmly to apply.
Step 7. Put transmission lever in neutral (N) position.
Step 8. Turn off all accessory switches. (down position)



b. Starting engine.

Step 1. Turn ignition switch (key) to ignition position. Check warning indicators (engine oil pressure, hydraulic/parking brake circuits, and battery). They must light. If any one fails to light, report failure to Organizational Maintenance. **DO NOT START ENGINE**

CAUTION

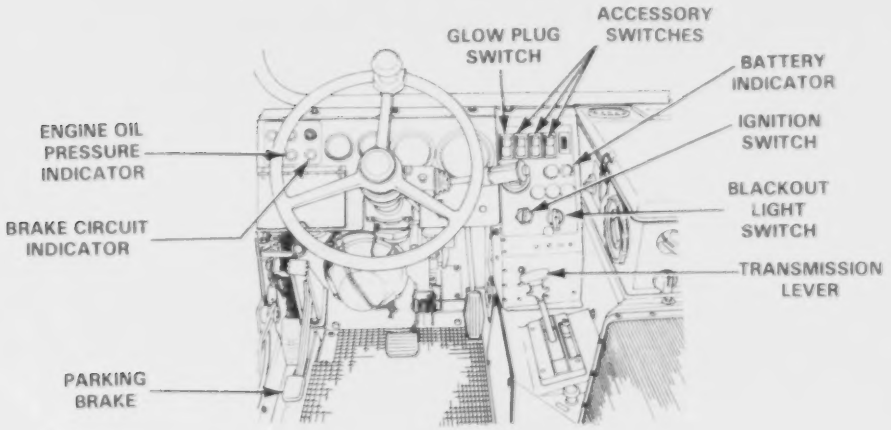
DO NOT hold glow plug/engine stop switch in the glow plug position for more than 60 seconds, or damage to glow plugs may result.

Step 2. Push glow plus switch to glow position. Hold for 15 seconds and release.
Step 3. Turn ignition switch (key) to start position. Release ignition switch (key) when engine starts.

CAUTION

If oil pressure or battery indicators remain lit, shut engine dowr and notify Organizational Maintenance.

Step 4. Check the engine oil pressure indicator. It should go out within 3 to 5 seconds.
Step 5. Check the battery indicator light. It should go out as soon as the engine starts.



c. Cold engine above -4°F (-20°C).

Step 1. Turn ignition switch (key) to ignition position. Check warning indicators (engine oil pressure, hydraulic/parking brake circuits, and battery). They must light. If any one fails to light, report failure to Organizational Maintenance. **DO NOT START ENGINE**

CAUTION

DO NOT hold glow plug/engine stop switch in the glow plug position for more than 60 seconds, or damage to glow plugs may result.

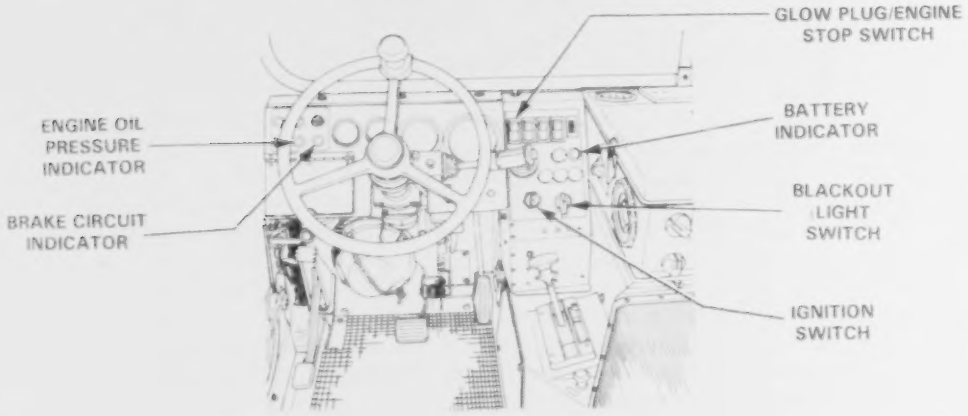
Step 2. If indicators light, press glow plug/engine stop switch to glow plug position. Hold for 30 seconds. **DO NOT RELEASE.**

Step 3. Depress accelerator pedal half-way and hold.

CAUTION

DO NOT hold ignition switch (key) in the start position more than 90 seconds, or damage to starter motor may result.

DO NOT run the engine above 1200 RPM after starting. Wait five minute with engine at an idle (750 to 850 RPM), or damage to the steering, lubrication systems, transmission and transfer may result.



READ STEPS 5 THROUGH 9 before turning ignition switch.

Step 4. Turn ignition switch (key) to start position, and hold. When engine has started, release glow plug switch.

Step 5. Immediately check the engine oil pressure indicator. (It should go out within 3 to 5 seconds)

Step 6. Battery indicator (it should go out as soon as the engine starts). If one or both indicators remain lit, shut engine down and notify Organizational Maintenance.

Step 7. Hold ignition switch (key) in start position until engine starts.

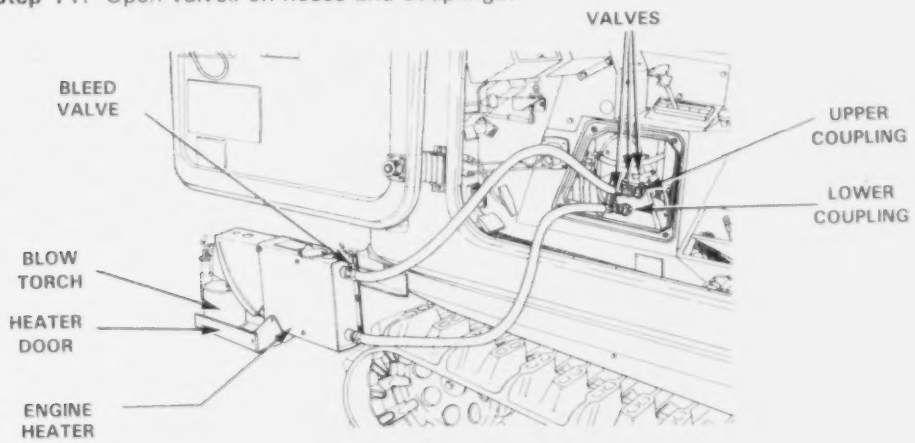
Step 8. Release ignition switch, let accelerator pedal up slowly.

Step 9. Operate engine below maximum RPM until proper operating temperatures are reached.

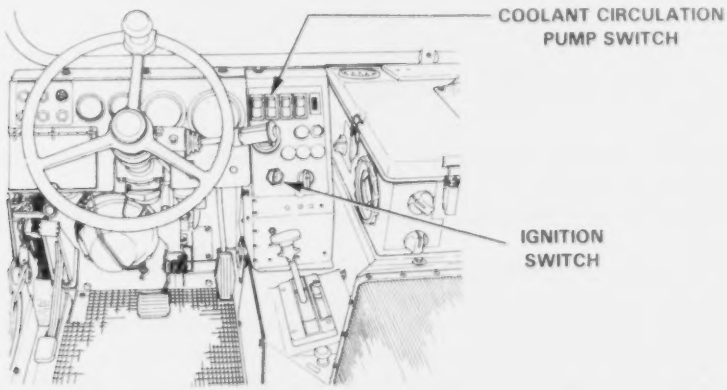
d. Cold engine below -4 °F (-20 °C).

Step 1. Perform engine starting procedure in paragraph 2-5 c, Steps 1 through 6.
Step 2. Hold ignition switch (key) in start position until engine idles smoothly and begins t pick up speed.
Step 3. Release ignition switch, let accelerator pedal up slowly.
Step 4. Operate engine below maximum RPM until proper operating temperatures are reac ed. If engine does not start, go to Step 5.
Step 5. Remove engine heater from rear car. See Appendix E for stowage location.
Step 6. Attach engine heater to left end of front car bumper.
Step 7. Open driver's door. Leave door fully open.

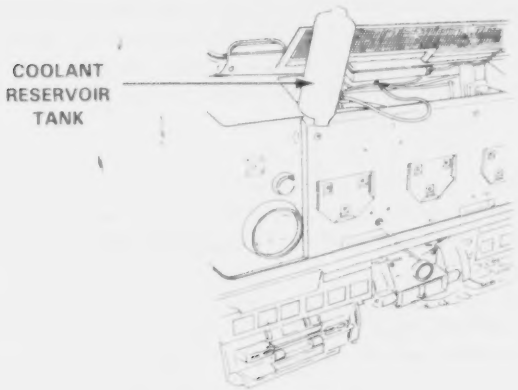
Step 8. Place engine heater hoses in driver's compartment on floor.
Step 9. Remove engine compartment left side access cover.
Step 10. Connect engine heater hoses. Connect top hose to upper coupling. Connect botto hose to lower coupling.
Step 11. Open valves on hoses and couplings.



Step 12. Start blow torch. Refer to paragraph 2-6a. through 2-6c.
Step 13. Turn ignition switch to on position.
Step 14. Press coolant circulation pump switch to on position. Insure that pump is operati
Step 15. Bleed air from engine heater.



Step 16. Begin the heating procedure by warming the outside of the engine arctic heater.
Step 17. Slowly insert the blow torch flame into the heater opening.
Step 18. Set blow torch on heater door.
Step 19. Open bleed valve; if coolant comes out, close valve and go to Step 24. If steam comes out, do steps 20 through 23.
Step 20. Remove blow torch from heater.
Step 21. Lift and support coolant reservoir tank. Remove tank cap.



Step 22. Insert blow torch into heater and place on heater door.
Step 23. Continue heating for 30 minutes, then go to Step 24.
Step 24. Perform engine starting procedure in paragraph 2-5 c. If engine does not start due to low batteries, perform vehicle slave procedure to start engine. Refer to paragraph 2-10. If engine still does not start, report failure to Organizational Maintenance.
Step 25. Remove blow torch from heater.
Step 26. Turn off blow torch. Refer to paragraph 2- 6d.
Step 27. Turn off coolant circulating pump switch.
Step 28. Close valves on hoses and couplings.
Step 29. Disconnect engine heater hoses.
Step 30. Remove heater from left end of bumper.
Step 31. Store engine heater in rear car. Store blow torch in front car.
Step 32. Put cap on reservoir tank. Put reservoir tank in place.

2-6. OPERATING BLOWTORCH.

a. Filling blowtorch.

WARNING

Do not fill blowtorch with fuel while blowtorch is still hot. Injury to personnel may result.

Step 1. Loosen filler cap. Release pressure. Remove filler cap.
Step 2. Use a strainer, fill with kerosene until 3/4 full. (Item 6, App. D)
Step 3. Put on and tighten cap firmly.

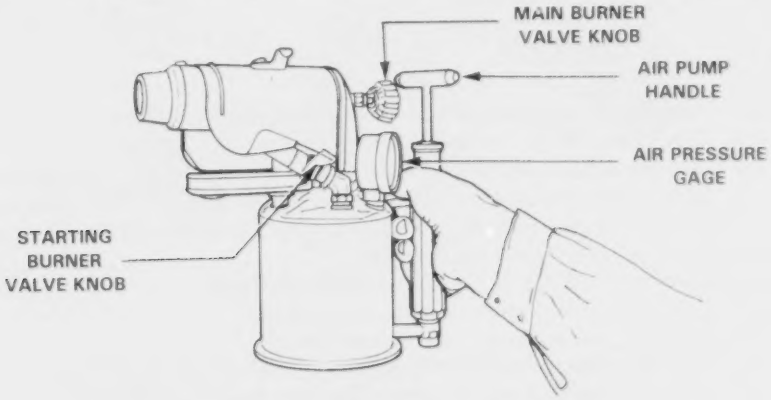
b. Normal operation and pre-heating of blowtorch.

Step 1. Turn main burner valve clockwise to the off position.
Step 2. Push starting burner valve down to the off position.
Step 3. Pump up air pressure to 14.5 PSI (100 kPa).
Step 4. Place blowtorch on a level surface, with the burner opening in the direction of the wind.
Step 5. Hold a lighted match in front of starter burner opening.
Step 6. Turn starter burner valve knob to open starting burner valve and ignite blowtorch.
Step 7. Adjust starting burner valve knob to maintain a steady flame.

NOTE

Allow starting burner flame to burn for 5-10 minutes (or longer at lower temperatures). Air pressure in excess of 14.5 PSI (100 kPa) will cause starting burner flame to go out.

Step 8. Pump up and maintain air pressure at 14.5 PSI (100 kPa) during preheating.
Step 9. Slowly turn the main burner valve knob to open the main burner valve.



NOTE

If the main burner flame is spitting or flaring, close the main burner knob and continue pre-heating.

Step 10. Allow main burner flame to burn at a reduced flame for 1 to 2 minutes.
Step 11. Turn starter burner valve knob to close starter burner valve.
Step 12. Check air pressure. Adjust pressure to 14.5 PSI (100 kPa), if necessary.
Step 13. Turn main burner valve knob fully open.

NOTE

The blowtorch may flare or blaze if: air pressure is too high; blowtorch temperature is too low; hard pumping causes air pressure to fluctuate.

Step 14. After two to three minutes pump up the air pressure to 43.5 PSI (300 kPa).

c. Low temperature operation and pre-heating of blowtorch.

Step 1. Close the main burner and starting burner valve knobs.
Step 2. Pump up air pressure to 14.5 PSI (100 kPa).
Step 3. Place blowtorch on a level surface, with the burner opening in the direction of the wind.
Step 4. Fill fuel bowl with fuel. (Item 3, App. D)
Step 5. Light fuel.
Step 6. Turn starter burner valve knob to open starting burner valve.
Step 7. Adjust starting burner valve knob to maintain a steady flame.

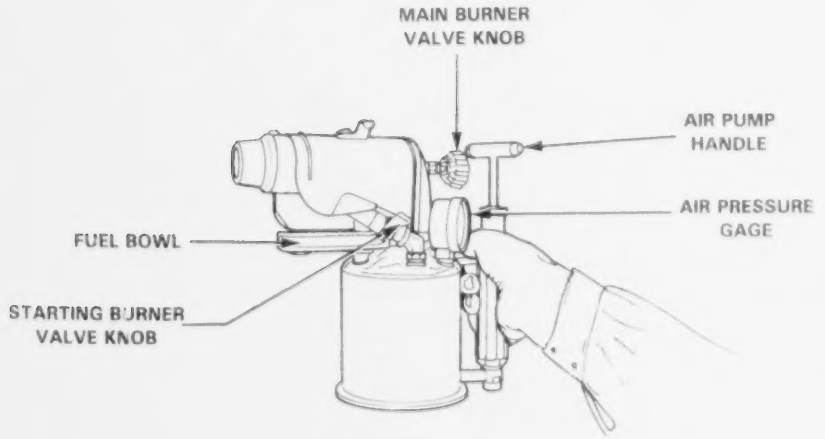
NOTE

Allow starting burner flame to burn for 5-10 minutes (or longer at lower temperatures). Air pressure in excess of 14.5 PSI (100 kPa) will cause starting burner flame to go out.

WARNING

Allow fuel bowl to burn out completely before pumping up air pressure or opening the main burner valve. Injury to personnel could result.

Step 8. Pump up and maintain air pressure at 14.5 PSI (100 kPa) during preheating.
Step 9. Slowly turn the main burner valve knob to open the main burner valve.



NOTE

If the main burner flame is spitting or flaring, close the main burner knob and continue preheating.

Step 10. Allow main burner flame to burn at a reduced flame for 1 to 2 minutes.
Step 11. Turn starter burner valve knob to close starter burner valve.
Step 12. Check air pressure. Adjust pressure to 14.5 PSI (100 kPa) if necessary.
Step 13. Turn main burner valve knob fully open.

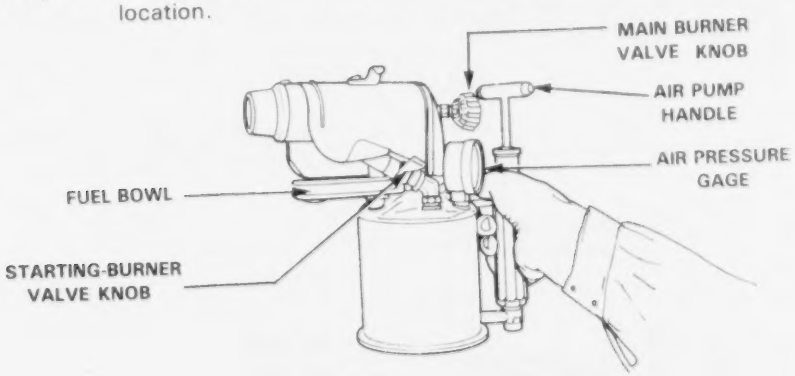
NOTE

The blowtorch may flare or blaze if: air pressure is too high; blowtorch temperature is too low; hard pumping causes air pressure to fluctuate.

Step 14. After two to three minutes, pump up the air pressure to 43.5 PSI (300 kPa).

d. Turning off blowtorch.

Step 1. Turn main burner valve knob to to fully closed.
Step 2. Allow blowtorch to cool.
Step 3. Loosen filler cap to release air pressure. Tighten filler cap.
Step 4. Store blowtorch in its proper place in the carrier. Refer to Appendix E for stowage location.



2-7. DRIVING CARGO CARRIER.

a. Place carrier in motion.

CAUTION

The carrier must be stopped with the transmission in neutral before the transfer is shifted to high or low range. Failure to do so may result in damage to transfer.

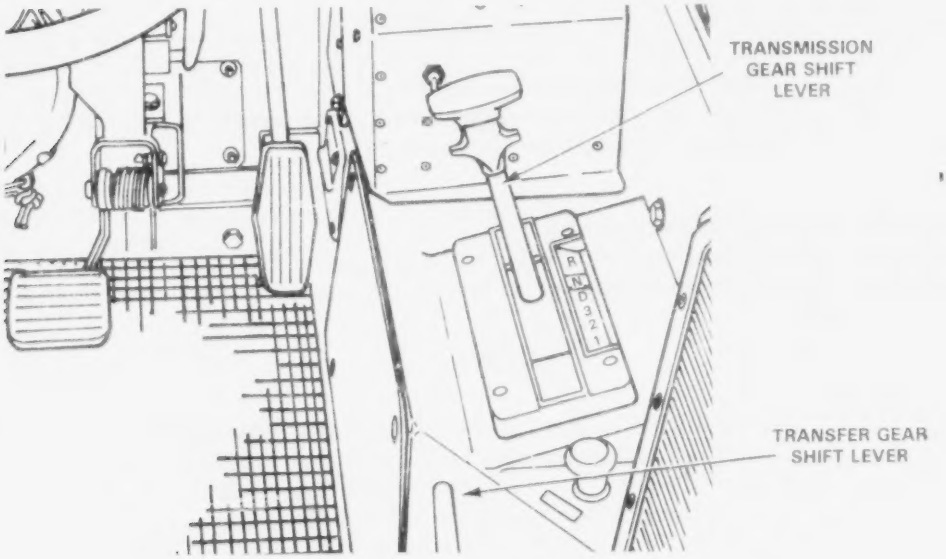
CAUTION

Do not place transmission in gear with engine running and transfer in neutral. To do so will damage transfer.

NOTE

When changing transfer ranges, to high or low range, the shift lever must be moved in one motion quickly through neutral. If the transfer shift cannot be made and the shift level remains in neutral, shut down the engine. Then move the shift lever into the high or low position.

Step 1. Place the transfer shift lever in high range position.



CAUTION

DO NOT hold ignition switch (key) in the start position more than 90 seconds, or damage to starter motor may result.
DO NOT run the engine above 1200 RPM after starting. Wait five minute with engine at an idle (750 to 850 RPM) or damage to the steering, lubrication systems, transmission and transfer may result.

Step 2. Start engine. Refer to paragraph 2-5.

CAUTION

The carrier must be stopped with the engine at idle (750 to 850 RPM) before shifting transmission into forward or reverse. Damage to the transmission may result.

NOTE

The automatic transmission has four forward and one reverse speeds. The gear shift lever has a spring-loaded latch to prevent shifting. The latch locks the shift lever in the R, N, and D positions. The shift lever latch must be lifted to change from R, N, and D positions. The shift lever can be moved freely through to D, 3, and 2 positions. The shift lever latch must be lifted to move the shift lever from 2 to 1 positions.

Step 3. Step on the service brake pedal..
Step 4. Place transmission gear shift lever in D position.

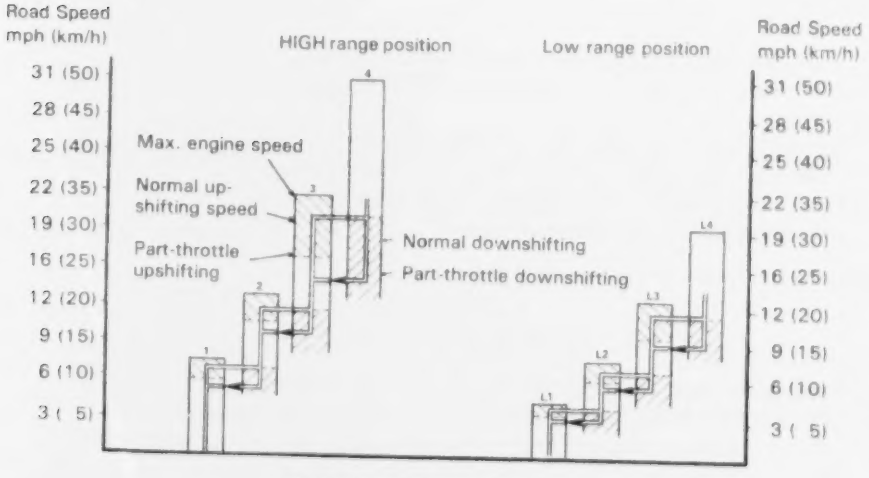
CAUTION

If the parking brake indicator remains lit after the release is pulled, apply the parking brake, shut down the engine and notify Organizational Maintenance).

Step 5. Release the parking brake.
Step 6. Immediately check the parking brake indicator (it should go out).
Step 7. Release the service brake and depress the accelerator pedal slowly to move the carrier.

NOTE

The automatic transmission shifting is controlled by the accelerator pedal. Depressing the pedal slightly provides earlier shifting. The more fully the pedal is depressed the more delayed the transmisson shifts. Study the diagram below for transmission and transfer shifting ranges.



GEAR SHIFTING DIAGRAM

b. Slowing down cargo carrier on level terrain.

Step 1. Remove foot from accelerator pedal.
Step 2. Pump service brake pedal.

c. Slow down of cargo carrier on down-hill grade.

Step 1. Shift transmission to lower gear to slow carrier.

NOTE

Use same gear for downhill as using for uphill.

Step 2. Release accelerator pedal.
Step 3. Pump service brake pedal.

d. Stopping, parking and shutting down engine.

Step 1. Take foot off accelerator.
Step 2. Push down service brake pedal slowly.
Step 3. Bring carrier to a stop.
Step 4. Apply parking brake firmly.

CAUTION

Before shutting down the engine, run it at a reduced speed (750 to 850 RPM) in neutral for 3 to 5 minutes. This will reduce turbocharger speed and allow both the turbocharger and the engine to cool. Failure to do so will place excessive wear on turbocharger.

Step 5. Press glow plug/engine stop switch to engine stop position.
Step 6. Turn ignition switch (key) to off position.
Step 7. Place front and rear grille covers in place.

NOTE

The purpose for removing the drain plugs is to prevent rain water collecting and freezing in the vehicle.

Step 8. If required remove front and rear car drain plugs.

2-8. OPERATING CARRIER LIGHTS.

a. Normal driving lights.

Step 1. Put ignition switch in IGNITION SWITCH or IGNITION position.
Step 2. Press blackout light switch button. Turn blackout light switch to position I.
Step 3. Put light switch in position.

b. Operating in blackout condition (instrument lights only).

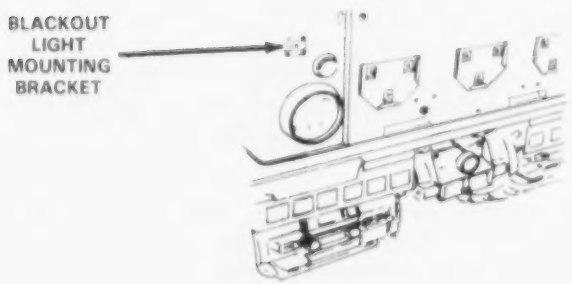
Step 1. Put ignition switch in IGNITION SWITCH or IGNITION position.
Step 2. Press blackout light switch button. Turn blackout light switch to position II

c. Mounting and stowing driving lights.

Step 1. Remove blackout driving lights from stowage compartment.
Step 2. Mount blackout driving lights in front of carrier. Tighten wing nuts.

d. Operating in blackout condition (with outside cab lights).

Step 1. Put ignition switch in IGNITION SWITCH or IGNITION position.
Step 2. Press blackout light switch button, turn blackout light switch to position III



NOTE

Black out driving lights should be installed so that light shines down in front of carrier.

Step 3. Loosen nut. Adjust light. Tighten nut.
Step 4. Check operation.
Step 5. Loosen wing nuts. Remove blackout lights from mounting brackets.
Step 6. Put blackout lights in stowage compartment.

1

LIGHT SWITCH IN HALFWAY-UP POSITION

- PARKING LIGHTS COME ON.
- MARKER LIGHTS COME ON.
- BRAKE LIGHTS COME ON, WHEN BRAKES ARE APPLIED.
- PULL DIRECTIONAL SIGNAL SWITCH, HIGH BEAM LIGHTS FLASH.

2

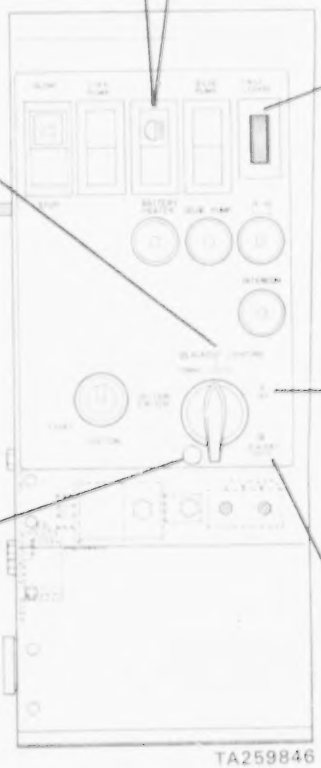
LIGHT SWITCH IN FULLY-UP POSITION

- HEADLIGHTS COME ON.
- PARKING LIGHTS COME ON.
- MARKER LIGHTS COME ON.
- BRAKE LIGHTS COME ON WHEN BRAKES ARE APPLIED.
- PULL DIRECTIONAL SIGNAL SWITCH, HIGH BEAM HEADLIGHTS COME ON.
- PUSH DIRECTIONAL SIGNAL SWITCH, LOW BEAM HEADLIGHTS COME ON.

INSTRUMENT PANEL RHEOSTAT

BLACKOUT LIGHT SWITCH POSITION I

FOR NORMAL DRIVING LIGHTS, SEE BOXES 1 AND 2.



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BLACKOUT LIGHT SWITCH POSITION II

- NORMAL DRIVING LIGHTS OFF.
- BLACKOUT LIGHTS OFF.
- INSTRUMENT PANEL LIGHTS GO OFF.
- INDICATOR WARNING LIGHTS STAY ON.

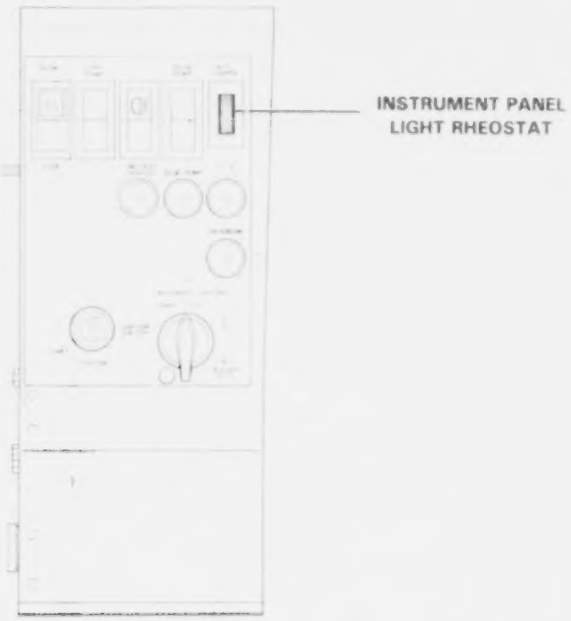
BLACKOUT LIGHT SWITCH TURNS ONLY WHEN BUTTON IS PUSHED IN.

BLACKOUT LIGHT SWITCH POSITION III

- NORMAL DRIVING LIGHTS OFF.
- BLACKOUT DRIVING LIGHTS COME ON.
- BLACKOUT MARKER LIGHTS COME ON.
- BLACKOUT BRAKE LIGHT COMES ON ONLY WHEN YOU PUSH BRAKE PEDAL.

e. Instrument panel light adjustment.

Move instrument panel rheostat up or down to adjust brightness of panel lighting.

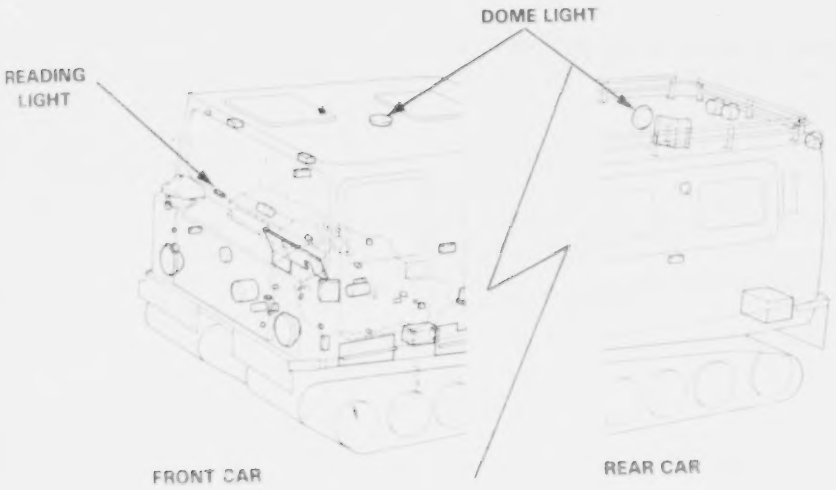


f. Dome lights.

Move switch to on or off position.

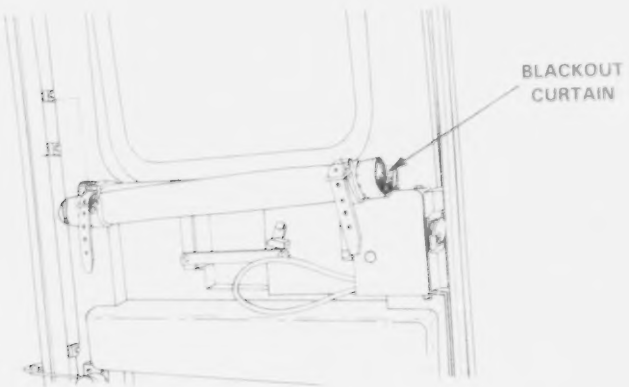
g. Reading light.

Step 1. Push cover up. Light comes on.
Step 2. Push cover down. Light goes out.



NOTE

Carrier dome lights may be operated under blackout condition by putting into place the blackout curtains.



g. Turn signals.

Step 1. Move directional signal switch up. Left turn signal light operates.
Step 2. Move directional signal switch down. Right turn signal light operates.

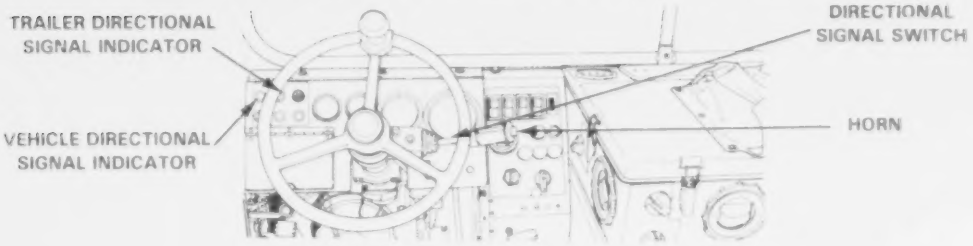
NOTE

Turn signal lever does not automatically return to off position after turn. Indicator light on instrument panel flashes when directional signal switch is moved up or down.

Step 3. Move directional signal switch to center position. Signal lights go off.

i. Horn.

Step 1. Push button on end of directional signal switch. Horn will sound.

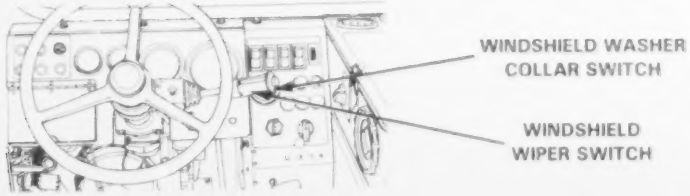


2-9. OPERATING WINDSHIELD WIPER AND WASHER.

NOTE

Ignition switch must be in ignition switch or ignition position.

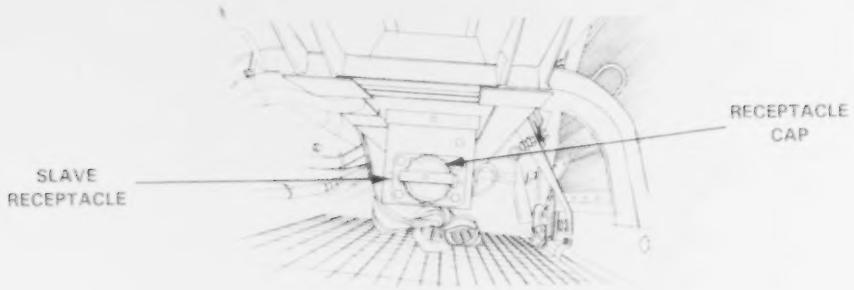
Step 1. Turn windshield wiper switch on directional signal switch to position I. Windshield wipers operate at low speed.
Step 2. Turn windshield wiper switch on directional signal switch to position II. Windshield wipers operate at high speed.
Step 3. Press windshield washer collar switch on directional signal switch. Windshield washer fluid sprays on windshield.
Step 4. Turn windshild wiper switch to 0 position. Windshield wipers stop in park position.



2-10. EMERGENCY STARTING.

Using slave receptacle.

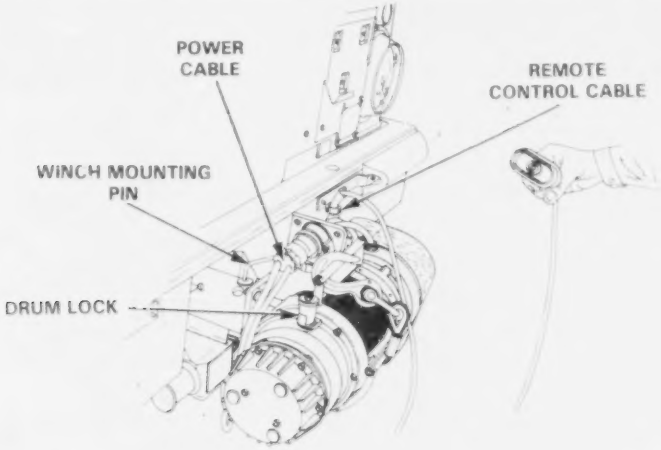
Step 1. Turn off ignition switch.
Step 2. Remove slave receptacle cap from receptacle under driver's seat.
Step 3. Connect one end of slave cable to power source.
Step 4. Connect other end of slave cable to slave receptacle under driver's seat.
Step 5. Start engine. Refer to paragraph 2-5.
Step 6. Disconnect slave cable.
Step 7. Put slave receptacle cap in place.



2-11. WINCH OPERATION.

a. Prepare winch for operation.

Step 1. Remove winch from stowage bracket.
Step 2. Install winch on front of vehicle. Put in winch mounting pin.
Step 3. Plug one end of power cable into vehicle slave receptacle and the other end into power receptacle on winch.
Step 4. Connect the remote control cable to winch control receptacle.



WARNING

Always wear heavy gloves when you handle winch cables. Never let cable run through your hands. Frayed cables can cut you.

b. Operating winch.

Step 1. Start Engine.

CAUTION

Do not use winch motor to pay out winch cable. Do not pull out winch cable with another vehicle. Damage to winch motor may result.

Step 2. Move remote control toggle switch to wind out position. Release toggle switch as soon as winch cable has some slack.

Step 3. Pull up drum lock and turn it 1/4 turn to unlock winch drum.

Step 4. Pull out by hand the needed length of cable.

NOTE

To avoid overloading of the winch, use a tackle block when rigging for winching.

Step 5. Remove tackle block from stowage location. See Appendix E for stowage location.

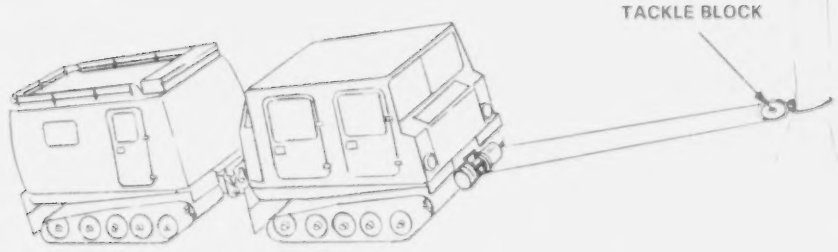
CAUTION

Rig cable to insure a straight pull is maintained on the winch. Winching with cable at an angle to winch drum can damage cable.

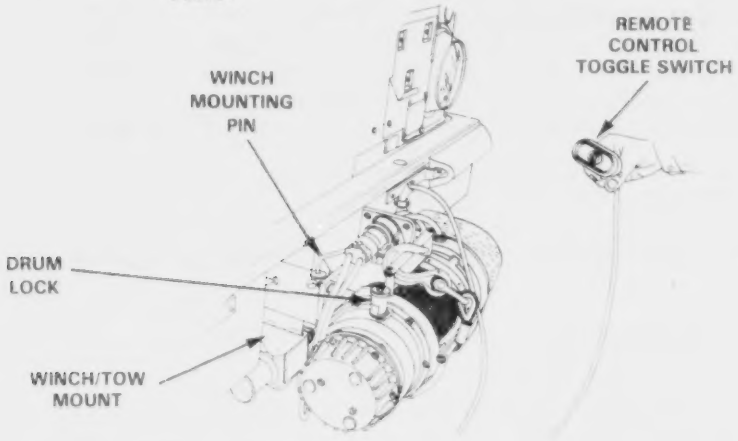
Step 6. Attach block with winch cable to a vehicle or permanent fixture.

WARNING

Clear all personnel from vehicle and from the path of the cable at a distance equal to the length of the cable. Cable could break causing injury to personnel.



Step 7. Turn drum lock until it falls into the lock position.
Step 8. Move remote control toggle switch to wind IN position. Release toggle switch to stop winching operation.
Step 9. Move toggle switch to wind OUT position until cable is slack. Disconnect winch cable.



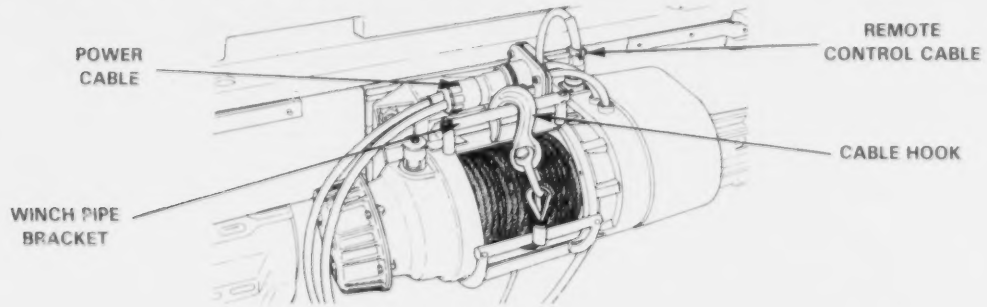
c. Prepare winch for travel.

Step 1. Disconnect block with cable from vehicle or permanent fixture.
Step 2. Maintain tension on cable to insure cable winds evenly on drum.
Step 3. Move remote control toggle switch to wind IN position.
Step 4. Remove block from cable. Stow block in stowage location.
Step 5. Wind IN cable until cable hook is near winch. Release toggle switch.
Step 6. Attach cable hook to winch pipe bracket.

CAUTION

Do not wind cable too tightly on drum. Damage to winch can result.

Step 7. Move remote control toggle switch to wind IN position until cable has slight tension. Release toggle switch.
Step 8. Shut off engine.
Step 9. Disconnect and stow remote control cable.
Step 10. Disconnect and stow power cable.

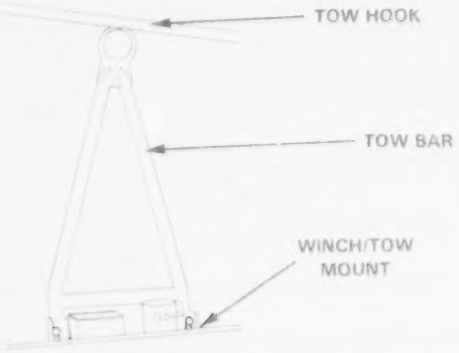


Step 11. Remove and stow winch.

2-12. TOWING.

a. Towing with tow bar.

Step 1. Attach tow bar to disabled vehicle.
Step 2. Connect tow bar to towing vehicle pintle.
Step 3. Put transmission selector of disabled vehicle in neutral position.
Step 4. Put transfer lever of disabled vehicle in neutral position.
Step 5. Release parking brake in disabled vehicle.

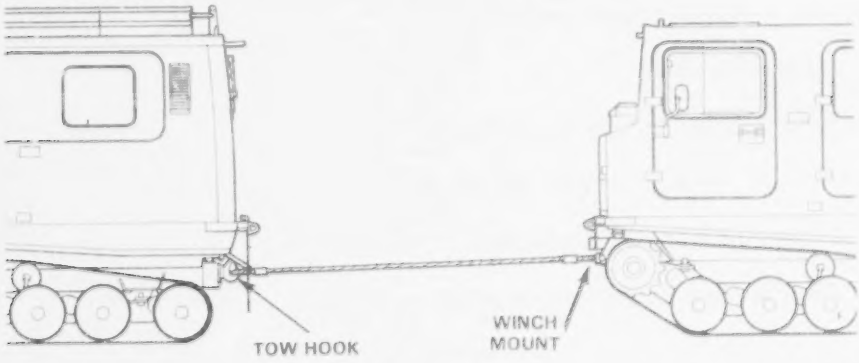


b. Towing with tow cable.

WARNING

Do not exceed 12 MPH (20 Km/h) when towing with tow cable. Disabled vehicle is difficult to steer. Damage to vehicle and injury to driver can occur.

Step 1. Attach tow cable to disabled vehicle.
Step 2. Attach tow cable to towing vehicle.
Step 3. Driver in disabled vehicle release parking brake. Place transmission and transfer selector levers in neutral position.
Step 4. Driver of towing vehicle, ease vehicle slowly forward until tow cable is tight.



NOTE

When possible start engine of disabled vehicle to assist in its steering. When steering systems lacks power-assist, five times as many turns of the steering wheel are required to steer vehicle.

Step 5. Driver of disabled vehicle use steer wheel knob when steering vehicle.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

2-13. SPECIAL INSTRUCTIONS.

a. Cleaning and inspecting.

(1) Clean vehicle more often.

(2) Inspect vehicle for damage after operating in rough terrain.

b. Lubricate according to LO 9-2350-272-12.

c. Use the following references.

(1) FM9-207 Operation and Maintenance of Ordnance Material in Extreme Cold Weather.

(2) FM 31-70 Basic Cold Weather Manual.

(3) FM 31-71 Northern Operations.

(4) FM 31-72 Mountain Operations.

2-14. OPERATING IN EXTREME COLD WEATHER.

a. General.

Vehicles need special attentions and care during periods of extreme cold weather. The following things occur in extreme cold:

(1) Lubricants thicken.

(2) Batteries might lose power and freeze.

(3) Electrical insulation might crack and cause short circuits.

(4) Engines are more difficult to start.

(5) Fiberglass and metals become brittle.

(6) POL products require special storage and handling.

(7) Special fuels may be required.

(8) Cooling systems require protection from freezing.

b. Operating vehicle.

(1) Use engine heater to warm engine. Refer to paragraph 2-5d.

(2) Use battery heater to warm batteries before cranking engine.

(3) Drive slowly for approximately the first 400 yards (365 meters). Let parts warm to normal operating temperature.

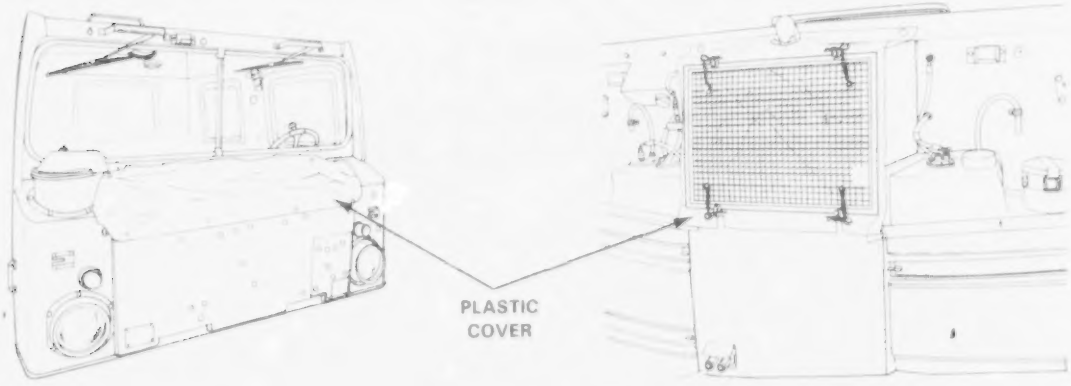
(4) Keep snow and ice from clogging radiator compartment.

c. Stopping and parking.

(1) Face vehicle away from wind.

(2) Park in sheltered area when possible.

(3) Install front and rear plastic covers.



2-15. OPERATING IN EXTREME HOT WEATHER.

a. Operating vehicle.

(1) Avoid continuous high speeds.

(2) Avoid continuous use of low gears on steep grade or rough terrain.

b. Stopping and parking.

(1) Run engine at idle to allow engine to cool down.

(2) Park in sheltered area when possible.

2-16. OPERATING IN SAND, MUD, OR SNOW.

Put transfer in low range.

Select proper transmission gear to prevent excessive shifting of transmission.

2-17. SWIMMING THE CARRIER.

a. Before entering the water.

WARNING

Front and rear cars must be water tight. Cars could sink causing damage to equipment and injury to personnel.

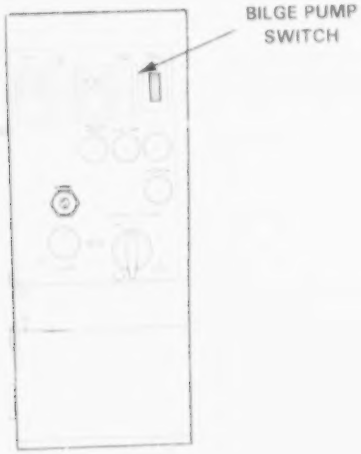
Step 1. Tighten drain plugs in front and rear car.

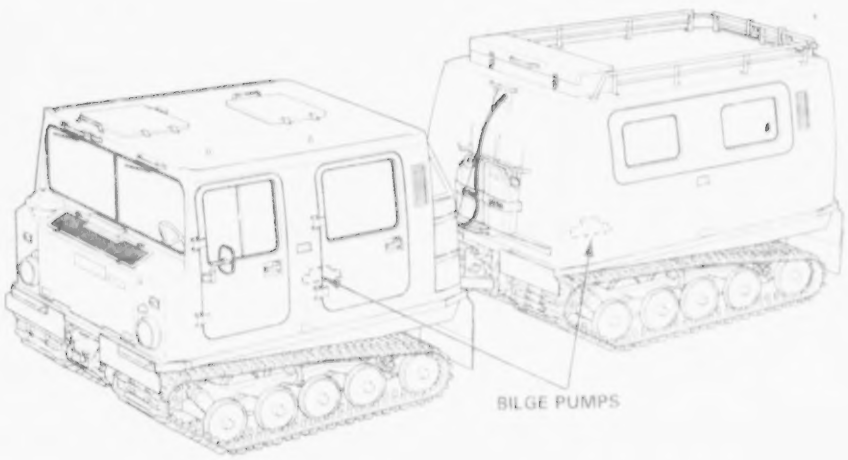
Step 2. Open both roof hatches on front car. If personnel are riding in rear car, ensure rear car side hatch can be opened.

NOTE

Tow cable will be used to assist in pulling carrier from the water should engine stop operating.

Step 3. Attach tow cable to front carrier towing adapter.
Step 4. Using lifting eye and shackle, attach the other end of tow cable to right rear corner of front car roof.
Step 5. Clean all door seals and door frames.
Step 6. All personnel put on life-jackets.
Step 7. Start bilge pumps. Check pump indicator light.
Step 8. Listen to each bilge pump to insure it is working.





Step 9. Insure all doors and windows are tightly closed.

b. Entering water.

Step 1. Operate vehicle with transmission gear selector in D position.
Step 2. Enter water slowly at a right angle to shoreline.
Step 3. Increase engine speed when front car is completely in water.
Step 4. Maintain an engine speed which will keep the front end of the vehicle slightly lifted.

c. Leaving the water.

Step 1. Slow vehicle before making contact with shore.
Step 2. Leave water slowly at a right angle to shoreline.
Step 3. Stop vehicle when both cars are clear of water.
Step 4. Turn off bilge pumps.
Step 5. Remove and stow tow cable and shackle.
Step 6. Close roof hatches.
Step 7. Lubricate all vehicle grease points.
Step 8. Check vehicle body for leaks where water may have entered.

2-18. OPERATING CARRIER CROSS COUNTRY.

Step 1. When operating in rough terrain, place mud guards in the up position.

CAUTION

Flying debris from tracks and bushes can damage mirrors.

Step 2. Fold in mirrors when operating in rough terrain.

CHAPTER 3
MAINTENANCE INSTRUCTIONS

Section I. TROUBLESHOOTING

3-1. GENERAL INSTRUCTIONS.

The troubleshooting table lists the common vehicle malfunctions you may find.

Do all tests, inspections, and corrective actions in the same order they appear in the Table.

Record all malfunctions and corrective actions on DA Form 2404.

The corrective action column lists only maintenance actions you can complete. Report all other malfunctions to Organizational Maintenance.

3-2. EXPLANATION OF COLUMNS FOR TROUBLESHOOTING TABLE.

The troubleshooting table has six columns:

a. Column 1.

Item number. Gives the table malfunction number.

b. Column 2.

Malfunction. Lists the common vehicle malfunctions you may find.

c. Column 3.

Probable cause. Lists the probable cause(s) for the malfunction in column 2. Check the probable causes in the same order they appear in the Table.

d. Column 4.

Test and Inspection. Lists the test or checks.

e. Column 5.

Corrective action. Lists the actions you must take to correct the cause of the malfunction.

f. Column 6.

Tools and equipment. Lists the tools and equipment you need to check or correct the malfunction.

TROUBLESHOOTING
SYMPTOM INDEX

SYMPTOM		PAGE
	ENGINE	
1.	Engine will not crank or cranks slowly	3-3
2.	Engine cranks but fails to start	3-3
3.	Engine starts, then stops	3-3
4.	Engine runs rough or lacks power	3-3
5.	Oil indicator light comes on while engine is running	3-3
6.	Engine overheats	3-3
	ELECTRICAL	
7.	Battery indicator light comes on while engine is running	3-4
	TRANSMISSION	
8.	Transmission indicator lights while driving	3-4
9.	Transmission in gear vehicle will not move	3-4
	BRAKES	
10.	Brake indicator light remains on after parking brake is released	3-4
	STEERING	
11.	Hard steering	3-4
	WINCH	
12.	Winch does not operate	3-5
13.	Winch stops during winching operation	3-5

TABLE 3-1 OPERATOR TROUBLESHOOTING CHART

ITEM NO.	MALFUNCTION	PROBABLE CAUSE	TEST/INSPECTION	CORRECTIVE ACTION	TOOLS/ EQUIPMENT
			01 ENGINE		
1.	Engine will not crank or cranks slowly.	Transmission selector level not in neutral.	Check selector lever position.	Place selector level in neutral position	None
		Low battery fluid level.	Check battery fluid level. Refer to Table 2-1.	Add distilled water (Item 26, Appendix D.)	None
		Discharged batteries		Slave start vehicle.	Slave cable
2.	Engine cranks but fails to start.	Low fuel level.	Check fuel level.	Fill fuel tanks.	None
		Contaminated fuel.	Check fuel sediment bowl. Refer to Table 2-1.	Notify organizational maintenance.	None
3.	Engine starts, then stops.	Glow plug/engine stop switch is in engine stop position.	Check switch position	Place switch in glow plug position	None
		Fuel shut off valve closed	Check fuel shut off valve.	Open fuel shutoff valve.	None
4.	Engine runs rough or lacks power	Contaminated fuel.	Check fuel sediment bowl. Refer to Table 2-1.	Notify organizational maintenance.	None
		Restricted air intake.	Check air cleaner intake.	Remove restriction	None
5.	Oil indicator light comes on while engine is running.	Low engine oil level.	Check oil level. Refer to Table 2-1.	Add oil as necessary.	None
6.	Engine overheats.	Low engine coolant level.	Check coolant level. Refer Table 2-1.	Add coolant as necessary.	None
		Low engine oil level.	Check oil level. Refer to Table 2-1.	Add oil as necessary.	None
		Debris in radiator compartment.	Check radiator compartment.	Remove debris	None
		Loose fan V-belt	Check belt tension. Refer to Table 2-1.	Notify organizational maintenance.	Straightedge and ruler.

TABLE 3-1. OPERATOR TROUBLESHOOTING CHART-CONT.

ITEM NO.	MALFUNCTION	PROBABLE CAUSE	TEST/INSPECTION	CORRECTIVE ACTION	TOOLS/ EQUIPMENT
			06 ELECTRICAL SYSTEM		
7.	Battery indicator light comes on while engine is running.	Loose alternator V-belts	Check belt tension. Refer to Table 2-1.	Notify organizational main-maintenance	Straightedge andruler
			07 TRANSMISSION		
8.	Transmission indicator lights while driving.	Driving in improper gear range.		Halt vehicle. Put transmission in neutral. Run engine at idle for 3-5 minutes. If light does not go out, notify organizational maintenance.	None
			08 TRANSFER		
9.	Transmission in gear vehicle will not move.	Transfer in neutral.	Check if transfer is in high or low range.	Place transfer in high or low range.	None
			12 BRAKES		
10.	Brake indicator light remains on after parking brake is released.	Parking brake lever not fully released.	Check parking brake.	Fully release parking brake.	None
			14 STEERING		
11.	Hard steering.	Low steering fluid level.	Check steering fluid level Refer to Table 2-1.	Add fluid as necessary.	None
		Ice or debris in steering unit	Check steering unit.	Clean steering unit.	None

TABLE 3-1. OPERATOR TROUBLESHOOTING CHART-CONT.

ITEM NO.	MALFUNCTION	PROBABLE CAUSE	TEST/INSPECTION	CORRECTIVE ACTION	TOOLS/ EQUIPMENT
			20 WINCH		
12.	Winch does not operate.	Power cable not securely connected.	Check power cable.	Securely connect power cable.	None
		Remote control cable not securely connected.	Check remote control cable.	Securely connect remote control cable.	None
13.	Winch stops during winching operation.	Winch overloaded	Check load.	Allow winch to cool. Reduce load or use double block. Refer to FM 20-22.	None

Section II. MAINTENANCE PROCEDURES

3-3. DRIVER DUTIES.

The operator is responsible for daily, weekly and monthly preventive maintenance checks and services. See Table 2-1 for PMCS.

The operator is responsible for these other maintenance services:

a. General cleaning of vehicle.

b. Remove dirt from around lubricating fluid fill points.

c. Remove dirt from lubricating grease points.

d. Inspect grease fittings for damage. Report damage to Organizational Maintenance.

3-4. REMOVE AND REPLACE TRACK.

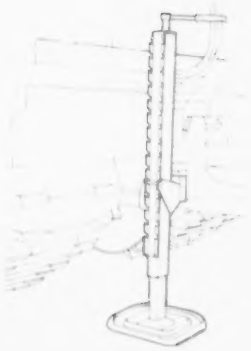
a. Remove Track.

Step 1. Remove front and rear mud guards on the side of vehicle on which track is to be replaced.

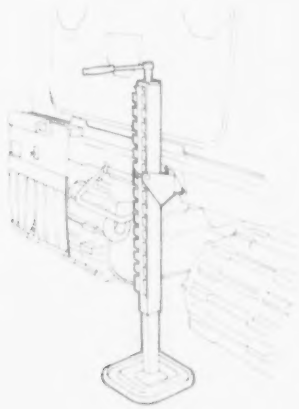
Step 2. Remove lifting jack, socket wrench handle and 19 mm socket from storage location. Refer to Appendix E.

NOTE

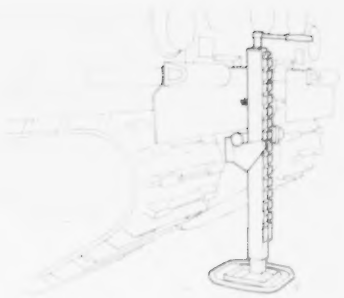
When raising the vehicles, place two jacks at lifting points as shown. If two jacks are not available, use one jack and cribbing.



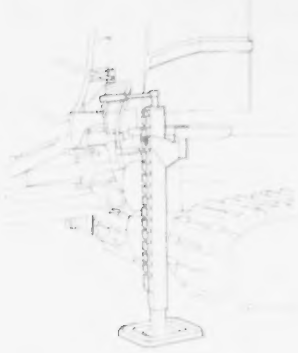
FRONT OF REAR CAR



REAR OF REAR CAR

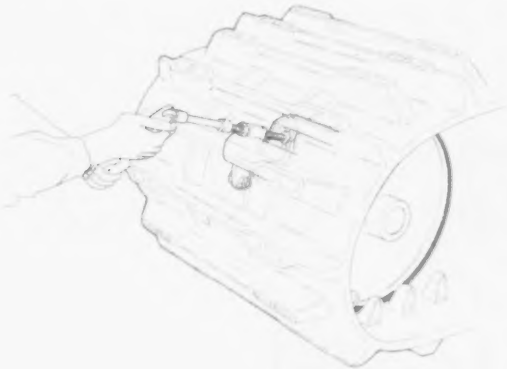


FRONT OF FRONT CAR

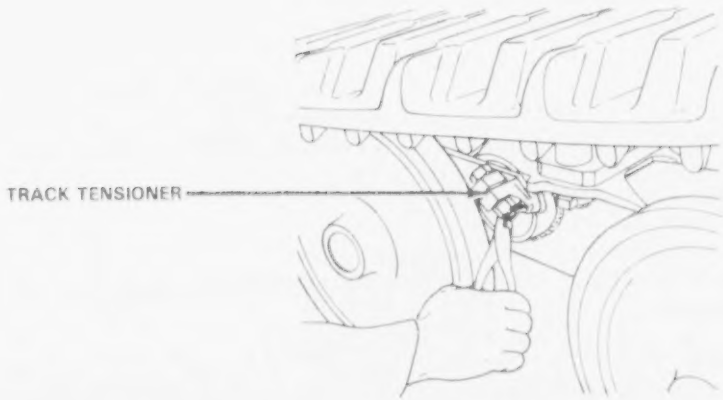


REAR OF FRONT CAR

Step 3 Loosen locknut and tensioning screw.

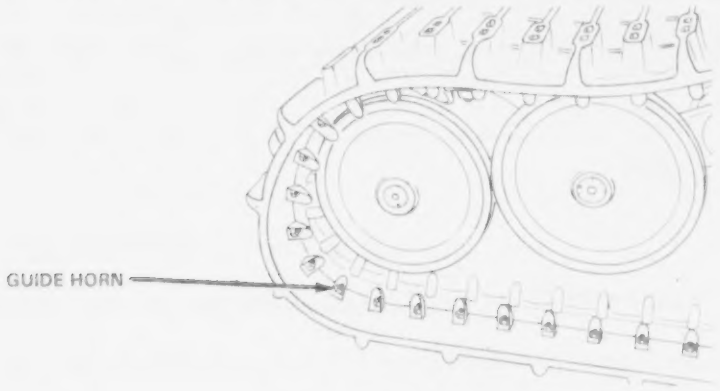


Step 4. Remove cotter pins, nuts and screws holding track tensioner in position.

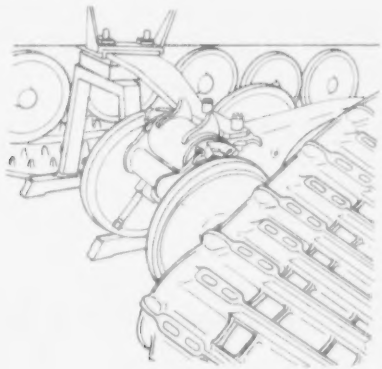


Step 5. Place socket with handle on top of jack and raise car so that wheels clear guide horns.

Step 6. Push track tensioner down and forward as far as it will go.



Step 7. Remove track starting at rear.



b. Replace.

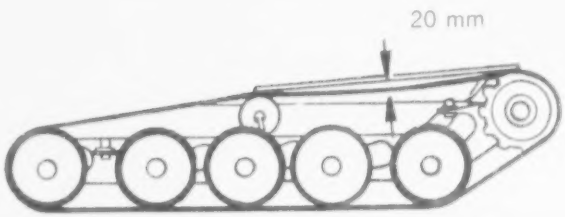
Step 1. Put track in place starting at the sprockets.
Step 2. Lower front of vehicle.
Step 3. Push track tensioner rearward as far as it will go.
Step 4. Put screws and nuts in place holding tensioner in operating position. Low side of screw must face up.
Step 5. Tighten nuts.
Step 6. Put in cotter pins.
Step 7. Lower rear of car and remove jacks, or jack and cribbing. Place jack, 19 mm socket and handle in storage location.
Step 8. Replace front and rear mud guards.
Step 9. Adjust track tension. Refer to paragraph 3-5.

3-5. ADJUST TRACK TENSION.

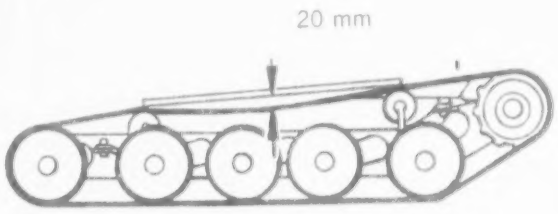
NOTE

Track tension should be adjusted outside in temperatures similar to those the vehicle is operated in, especially in extreme cold weather.

Step 1. Let carrier coast to a standstill on flat level ground.
Step 2. Place a straight edge on track between sprocket and support wheel.
Step 3. Place rule at the center of the straight edge. Measure distance between straight edge and track. Correct distance is 13/16 to 1 9/16 in. (20 to 40 mm).



Track tension, one support wheel

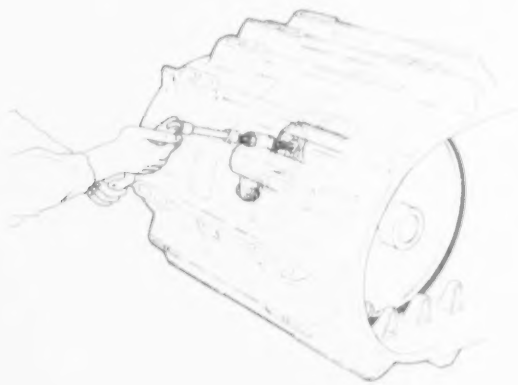


Track tension, two support wheels

NOTE

Track tension is adjusted by the track tensioner adjusting screw. Turn screw clockwise to increase tension. Turn screw counter-clockwise to decrease tension.

Step 4. Loosen lock nut.
Step 5. Turn adjusting screw to adjust track.
Step 6. Tighten lock nut.



APPENDIX A
REFERENCES

A-1. Scope

Appendix A has 4 lists:

- forms
- technical manuals
- field manuals
- other publications referenced in this manual.

A-2. Forms

Accident Identification Card	DD Form 518
Equipment Inspection and Maintenance Work Sheet	DA Form 2404
Maintenance Request	DA Form 2407
Quality Deficiency Report	SF 368
Operator's Permit	SF 46
Recommended Changes to DA Publications	DA Form 2028-2
Vehicle Accident Report	SF 91

A-3. Field Manual

Basic Cold Weather Manual	FM 31-70
Mountain Operations	FM 31-72/90-6 (HTF)
Northern Operations	FM 31-71
Operation and Maintenance of Ordnance Material in Cold Weather (0 ° to – 65 °F)	FM 9-207
Camouflage	FM 5-20
Vehicle Recover Operations	FM 20-22

A-4. Technical Manuals

Operator's Organizational DS and GS Maintenance Manual: Storage Batteries Lead-Acid Type	TM 9-6140-200-14
Painting Instructions For Field Use	TM 9-213
Chemical, Biological, Radiological (CBR) Decontamination	TM 3-220
Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use	TM 750-244-6
Deep Water Fording of Ordnance Material	TM 9-238

A-5. Other Publications

Lubrication Order: Carrier, Cargo, Tracked, 1 ½ Ton M973	LO 9-2350-272-12
The Army Maintenance Management System (TAMMS)	DA PAM 738-750

APPENDIX B
COMPONENTS OF END ITEM LIST AND BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

B-1. SCOPE.

This appendix lists integral components and basic issue items for the M973 CARGO CARRIER to help you inventory items required for safe and efficient operation.

B-2. GENERAL.

The Components of End Item list and Basic Issue Items lists are divided into two sections:

NOTE

Replacement items listed may be different than those originally issued with the vehicle.

a. **Section II.**

Components of End Item. These items are part of the end item, but are removed and separately packaged for transportation of shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts.

b. **Section III.**

Basic Issue Items. These are the minimum essential items required to place the M973 CARGO CARRIER in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, BII must be with the M973 CARGO CARRIER during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement BII, based on TOE/MTOE authorization of the end item.

B-3. EXPLANATION OF COLUMNS.

The following provides an explanation of columns found in the tabular listings:

a. **Column (1).**

Illustration Number. This column indicates the number of the illustration in which the item is shown.

b. **Column (2).**

National Stock Number. Indicates the National Stock Number assigned to the item and will be used for requisitioning purposes.

c. **Column (3).**

Description to identify and locate the item. The last line for each indicates the FSCM (in parentheses) followed by the part number. If items needed differs for different models of this equipment, the model is shown under the "Usable On" heading in this column. These codes are identified as:

CODE Used on

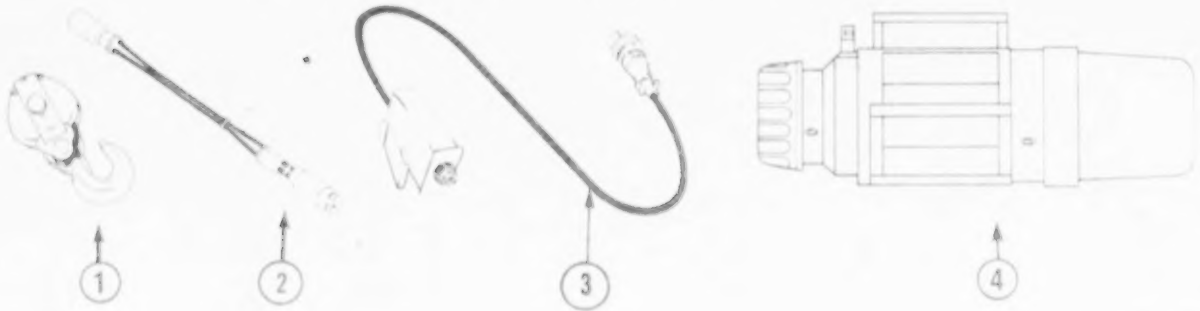
d. **Column (4).**

Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr).

e. **Column (5).**

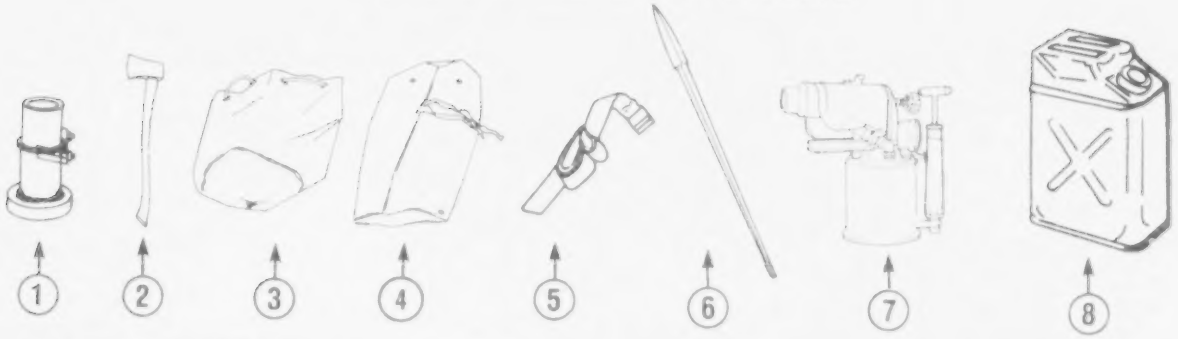
Quantity required (Qty rqr). Indicates the quantity of the item authorized to be used with/on the equipment.

Section II. COMPONENTS OF END ITEM LIST



(1) ILLS NO.	(2) NSN	(3) Description FSCM and Part Number	Usable on Code	(4) U/M	(5) Qty rqr
1	3940-00-880-0590	BLOCK, ASSEMBLY (19207) 11601231 (Rear car, under left seat)		EA	1
2	2590-00-148-7961	CABLE ASSEMBLY, POWER, ELECTRICAL W/ADAPTERS (19207) 11682379-1 (Rear car, under left seat)		EA	1
3	5930-00-173-0008	CABLE ASSEMBLY-SWITCH, ELECTRICAL (53530) 52.08.106 (Rear car, under left seat)		EA	1
4	2590-01-205-2707	WINCH ASSEMBLY, ELECTRIC, SINGLE SPEED, PLANETARY (S3530) 60.08.100 (Front car)		EA	1

Section III. BASIC ISSUE ITEMS



(1) ILLS NO.	(2) NSN	(3) Description FSCM and Part Number	Usable on Code	(4) U/M	(5) Qty rqr
1	2590-01-179-4076	ADAPTER, STEERING GEAR ASSEMBLY (S3465) 453 7054-801 (Rear car stowage box)		EA	2
2	5110-00-293-2336	AX, SINGLE BIT (19207) 6150925 (Rear car stowage box)		EA	1
3	6240-01-225-8518	BAG, BLACKOUT LAMP (S3465) 453 7829-801 (Front car stowage box)		EA	1
4	8105-01-235-5454	BAG, EXTENSION LAMP (S3465) 453 7848-801 (Front car stowage box)		EA	1
5	5340-01-176-1394	BAND, ELASTIC (S3465) 353 6248-801 (Front car stowage box)		EA	4
6	5120-00-224-1390	CROWBAR (19207) 11677049-1 (Rear car stowage box)		EA	1
7	5120-01-165-4784	BLOWTORCH, 1.1 W/PRESSURE GAGE (S3465) 353 6169-801 (Front car stowage box)		EA	1
8	7240-00-222-3088	CAN, FUEL 5 GAL (81902) 14196P1 (Front of rear car)		EA	2

Section III. BASIC ISSUE ITEMS (CONTINUED)

9

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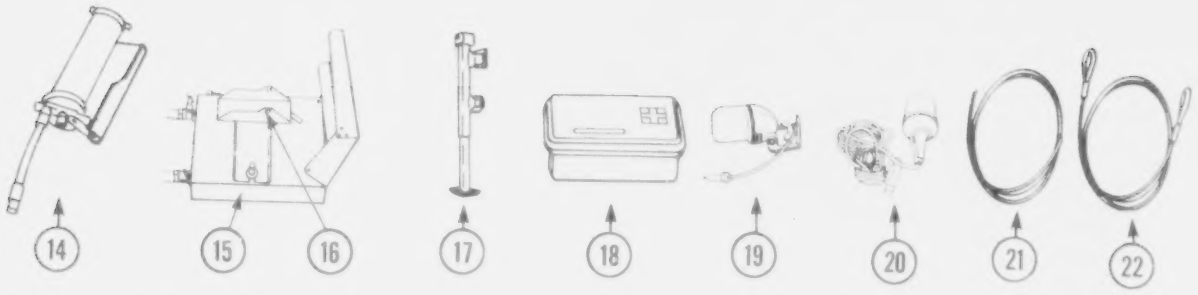
13

(1) ILLS NO.	(2) NSN	(3) Description FSCM and Part Number	Usable on Code	(4) U/M	(5) Qty rqr
9	6220-01-166-2186	CASE, W/SPARE LIGHT BULBS (S3465) 253 6214-801 (Front car stowage box)		EA	1
10	2540-01-167-1701	COVER, FRONT, PLASTIC (S3465) 353 6212-001 (Front car, behind passenger seat)		EA	1
11	2540-01-166-0575	COVER, REAR, PLASTIC (S3465) 353 6213-001 (Front car, behind passenger seat)		EA	1
12		DELETED			
13	4210-00-555-8837	EXTINGUISHER, FIRE (19207) 10916537 (Front and rear car)		EA	2

Section III. BASIC ISSUE ITEMS (CONTINUED)

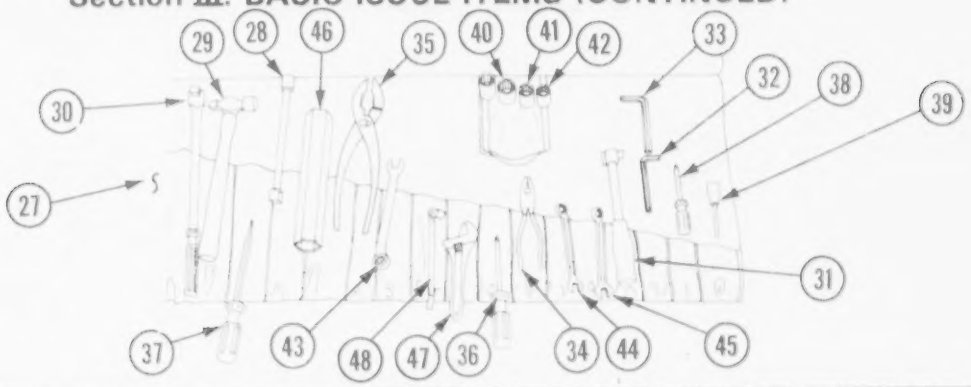


(1) ILLS NO.	(2) NSN	(3) Description FSCM and Part Number	Usable on Code	(4) U/M	(5) Qty rqr
14	4930-00-253-2478	LUBRICATING GUN, HAND (11083) 8F9866 (Front car stowage box)		EA	1
15	2990-01-163-5024	HEATER, ENGINE (S3465) 353 6614-801 (Rear car, under right seat)		EA	1
16	5340-01-167-1714	HOLDER, ENGINE HEATER (S3465) 353 6783-801 (Rear car, under right seat)		EA	1
17	5120-01-163-5077	JACK, LIFTING 2½ TON (S3465) 153 6369-801 (Rear car stowage box)		EA	1
18	6545-00-922-1200	KIT, FIRST AID (19207) 11677011 (Front car stowage box)		EA	1
19	6240-01-212-3255	LAMP, BLACKOUT (S3465) 453 7839-801 (Front car stowage box)		SET	1
20	6230-01-212-3328	LAMP, EXTENTION, W/10 m CABLE, W/RED AND WHITE PLASTIC COVER (S3465) 453 7844-801 (Front car stowage box)		EA	1
21	4020-01-005-2401	ROPE, FIBROUS 13.333 YD (57010) 690320 (Front car stowage box)		EA	1
22	4010-00-767-3149	LINE, TOW, 16 mm DIA., 5 m LONG (19207) 10861718 (Rear car stowage box)		EA	1

Section III. BASIC ISSUE ITEMS (CONTINUED)

(1) ILLS NO.	(2) NSN	(3) Description FSCM and Part Number	Usable on Code	(4) U/M	(5) Qty rqr
23	7240-00-177-6154	SPOUT, FUEL CAN (09647) 838A7511 (Front car stowage box)		EA	1
24	4930-00-275-7900	OILER, HAND 6 OZ (95879) 6121 (Front car stowage box)		EA	1
25	5340-00-682 1505	PADLOCK SET, 10 LOCKS, W/5 KEYS (96906) MS21313-52		SET	1
26	5120-01-163-4753	PLATE, JACK SUPPORT FOOT (S3465) 353 6315-001 (Rear car stowage box)		EA	2

Section III. BASIC ISSUE ITEMS (CONTINUED)

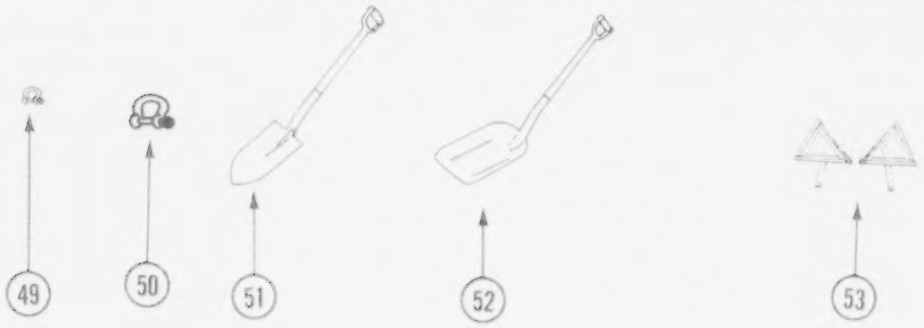


(1) ILLS NO.	(2) NSN	(3) Description FSCM and Part Number	Usable on Code	(4) U/M	(5) Qty rqr
27	2540-01-176-1314	BAG, TOOL (S3465) 2536393-801 (Front car stowage box)		EA	1
28	5120-00-227-8074	EXTENSION, SOCKET WRENCH, ½ in. SQ-DRIVE 10 in. LONG (19207) 11655788-1 (Tool bag)		EA	1
29	5120-00-061-8543	HAMMER, HAND: BLACKSMITH'S BALL PEEN (19207) 11677028 (Tool bag)		EA	1
30	5120-00-236-7590	HANDLE, SOCKET WRENCH: HINGED TYPE, ½ in. SQ-DRIVE (19207) 11655786-1 (Tool bag)		EA	1
31	5120-00-230-6385	HANDLE, SOCKET WRENCH: RATCHET, ½ in. SQ-DRIVE (18876) 8528574 (Tool bag)		EA	1
32	5120-01-045-4893	KEY, SOCKET HEAD SCREW: HEX DRIVE, L-TYPE HANDLE, 8 mm (55719) AWM-8C (Tool bag)		EA	1
33	5120-01-045-4895	KEY SOCKET HEAD SCREW: HEX DRIVE, L-TYPE HANDLE, 10 mm (55719) AWM-10C (Tool bag)		EA	1

Section III. BASIC ISSUE ITEMS (CONTINUED)

(1) ILLS NO.	(2) NSN	(3) Description FSCM and Part Number	Usable on Code	(4) U/M	(5) Qty rqr
34	5110-00-222-2708	PLIERS, DIAGONAL-CUTTING (79000) 39 (Tool bag)		EA	1
35	5120-00-223-7397	PLIERS, SLIP JOINT (19207) 5214421 (Tool bag)		EA	1
36	5120-00-234-8913	SCREWDRIVER, CROSS TIP MED. (34623) M515224-5 (Tool bag)		EA	1
37	5120-00-227-7356	SCREWDRIVER, FLAT TIP MED. (55719) SSDE-66 (Tool bag)		EA	1
38	5120-00-222-8866	SCREWDRIVER, FLAT TIP SMALL (80372) 4151547 (Tool bag)		EA	1
39	5120-01-250-7598	SOCKET, ALLEN WRENCH, 8 x 100 mm ½ in. drive (S3465) 121442 (Tool bag)		EA	1
40	5120-00-287-4153	SOCKET, SOCKET WRENCH, ½ in. sq-drive, 24 MM (55719) SWM 241 (Tool bag)		EA	1
41	5120-00-240-1428	SOCKET, SOCKET WRENCH, ½ in. sq-drive, 19 mm (55719) SWM-191 (Tool bag)		EA	1
42	5120-00-263-4143	SOCKET, SOCKET WRENCH, ½ in. sq -drive 17 mm (30106) 32417-08 (Tool bag)		EA	1
43	5120-01-054-7135	WRENCH, COMBINATION, BOX AND OPEN END, 17 mm (15526) 600-17MMX17MM (Tool bag)		EA	1
44	5120-01-054-7131	WRENCH, COMBINATION, BOX AND OPEN END, 13 mm (15526) 600-13MMX13MM (Tool bag)		EA	1
45	5120-00-228-9506	WRENCH, COMBINATION, BOX AND OPEN END, ½ in. (07971) 1162 (Tool bag)		EA	1
46	5120-01-176-1349	WRENCH, HEX SOCKET, 36 mm (S3465) 353 6550-001 (Tool bag)		EA	1
47	5120-01-127-6857	WRENCH, OPEN AND ADJUSTABLE, COMBINATION (75347) D501-8 (Tool bag)		EA	1
48	5120-01-214-8702	WRENCH, UNIVERSAL SOCKET 10 x 11 (S3465) M6131-112010 (Tool bag)		EA	1

Section III. BASIC ISSUE ITEMS (CONTINUED)



(1) ILLS NO.	(2) NSN	(3) Description FSCM and Part Number	Usable on Code	(4) U/M	(5) Qty rqr
49	4030-01-196-8040	SHACKLE, 3 TON (S3465) 2183 2523-022 (Rear car stowage box)		EA	1
50	4030-00-914-4705	SHACKLE, 5 TON (19207) 7358028 (Rear car stowage box)		EA	1
51	5120-00-293-3336	SHOVEL, HAND, ROUND POINT D-HANDLE (19207) 11655784 (Rear car stowage box)		EA	1
52	5120-00-494-1863	SHOVEL, SNOW (83796) 0418 (Rear car stowage box)		EA	1
53	9905-00-148-9546	REFLECTOR TRIANGLE WARNING KIT (81348) RR-W-1817 (Front car stowage box)		KT	1
54	5120-00-224-1389	BAR, PRY (72915) 8041183		EA	1

APPENDIX C
ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

C-1. SCOPE.

This appendix lists additional items you are authorized for the support of the M973 cargo carrier.

C-2. GENERAL.

This list identifies items that do not have to accompany the M973 cargo carrier and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

C-3. EXPLANATION OF LISTING.

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (i.e., CTA, MTOE, TDA, or JTA) which authorizes the item(s) to you.

Section II. ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NO.	(2) DESCRIPTION FSCM & PART NO.	USABLE ON CODE	(3) U/M	(4) QTY. AUTH.
	MTOE AUTHORIZED ITEMS			
7310-00-285-6155	STOVE, COOK (18789) 6155 (Front car stowage box)		EA	1

APPENDIX D
EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

D-1. SCOPE.

This appendix lists expendable supplies and materials you will need to operate and maintain the M973 CARGO CARRIER. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Insignia Items).

D-2. EXPLANATION OF COLUMNS.

a. Column (1).

Item number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., Use Dry Cleaning Solvent, item 20, app. D).

b. Column (2).

Level. This column identifies the lowest level of maintenance that requires the listed item.

C — Operator/Crew
O — Organizational Maintenance
F — Direct Support Maintenance

c. Column (3).

National Stock Number. This is the National Stock Number assigned to the item. Use it to request or requisition the item.

d. Column (4).

Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parentheses followed by the part number.

e. Column (5).

Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. The measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pri). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	C	6850-00-181-7929	ANTIFREEZE: PERMANENT ETHYLENE GLYCOL (-65°) INHIBITED (MIL-A-46153) 1 GAL. CONTAINER	GAL.
2	C	9150-00-698-2382	DEXTRON II (MIL-L-2104) 5 GAL. CAN	GAL.
3	C	6810-00-543-7415	ETHANOL, DENATURED (O-E-00760) 5 GAL. CAN	GAL.
4	C	9150-01-102-9455	FLUID, BRAKE SILICONE (MIL-B-46176) 1 GAL. PLASTIC	GAL.
5	C	9150-00-935-1017	GAA, GREASE, AUTOMOTIVE AND ARTILLERY (MIL-L-10924) 14 OZ. CARTRIDGE	OZ.
6	C	9130-00-559-2475	KEROSENE (MILR 25576) 55 GAL. DRUM	GAL.
7	C	9150-00-234-5200	LUBRICANT CHAIN AND WIRE ROPE, CWII (VV-L-751) 5 LB. CAN	LB.
8	C	9140-00-286-5295	OIL, FUEL, DIESEL, DF-2, REGULAR (VV-F-800) 5 GAL. CAN	GAL.
9	C	9140-00-286-5287	OIL, FUEL, DIESEL, DF-1, WINTER (VV-F-800) 5 GAL. CAN	GAL.
10	C	9140-00-286-5282	OIL, FUEL, DIESEL, DF-A (ARCTIC) (VV-F-800) 5 GAL. CAN	GAL.
11	C	9150-01-035-5392	OIL, LUBRICATING, GEAR GO 80/90 (MIL-L-2105) 1 QT. CAN	QT.
12	C	9150-01-035-5393	OIL, LUBRICATING, GEAR GO 80/90 (MIL-L-2105) 5 GAL. CAN	GAL.
13	C	9150-01-152-4117	OIL, LUBRICATING, OE/HDO 15/40 (MIL-L-2104) 1 QT. CAN	QT.
14	C	9150-01-152-4118	OIL, LUBRICATING, OE/HDO 15/40 (MIL-L-2104) 5 GAL. CAN	GAL.

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST (CONTINUED)

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
15	C	9150-00-189-6727	OIL, LUBRICATING, OE/HDO 10 (MIL-L-2104) 1 QT. CAN	QT
16	C	9150-00-186-6668	OIL, LUBRICATING, OE/HDO 10 (MIL-L-2104) 5 GAL. CAN	GAL
17	C	9150-00-402-4478	OIL, LUBRICATION, ENGINE, ARCTIC (ICE, SUB-ZERO) (MIL-L-46167) 1 QT. CAN	QT
18	C	9150-00-402-2372	OIL, LUBRICATION, ENGINE, ARCTIC (ICE, SUB-ZERO) (MIL-L-46167) 5 GAL. CAN	GAL
19	C	9150-01-035-5390	OIL, LUBRICATING, GEAR GO 75 (MIL-L-2105) 1 QT. CAN	QT
20	C	9150-01-035-5391	OIL, LUBRICATING, GEAR GO 75 (MIL-L-2105) 5 GAL. CAN	GAL
21	C	9150-00-971-6643	OIL, LUBRICANT, INSTRUMENT, AIRCRAFT (MIL-L-6085) 8 OZ. CAN	EA
22	C	9150-00-250-0926	PETROLATUM TECHNICAL (VASELINE, INDUSTRIAL) (V-V-P236)	PT
23	C	7920-00-205-1711	RAGS, WIPING (58536) A-A-531	LB
24	C	6850-00-664-5685	SOLVENT, DRY CLEANING, SD (P-D-680, TYPE III) 1 QT. CAN	QT
25	C	6850-00-281-1985	SOLVENT, DRY CLEANING, SD (P-D-680, TYPE III) 1 GAL. CAN	GAL
26	C	6810-00-356-4936	WATER, DISTILLED, 5 GAL. CONTAINER	GAL
27	C	6850-00-926-2275	WINDSHIELD WASHER FLUID CLEANING, COMPOUND, WINDOW	PT

APPENDIX E

STOWAGE AND SIGN GUIDE

Section I. INTRODUCTION

E-1. SCOPE.

This appendix shows the location for stowage of equipment and material required to be carried on the M973 Cargo Carrier and also the location of decals, stencils and metal signs.

E-2. GENERAL.

The illustrations in Sections II and III show the location of decals, stencils, metal signs, and equipment stowage which are needed for proper and safe operation of the carrier.

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Section II. DECALS, STENCILS AND METAL SIGNS

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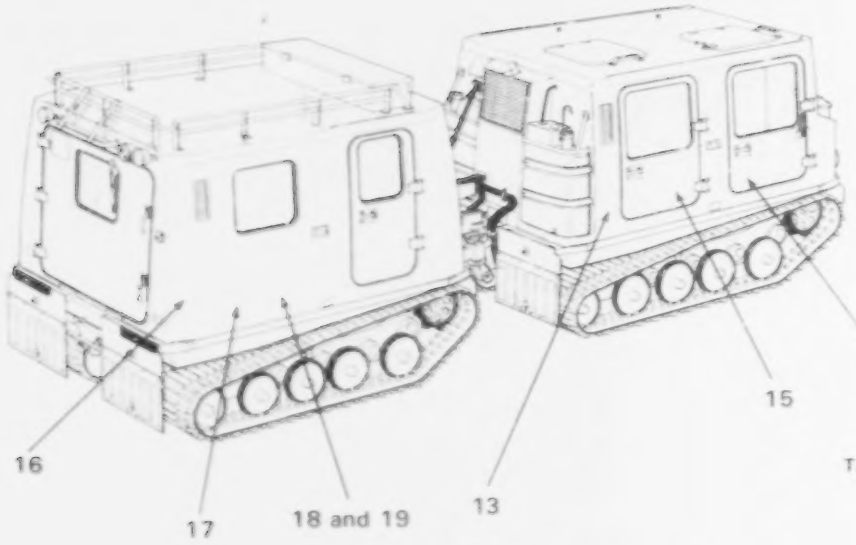
Section III. EQUIPMENT STOWAGE LOCATION



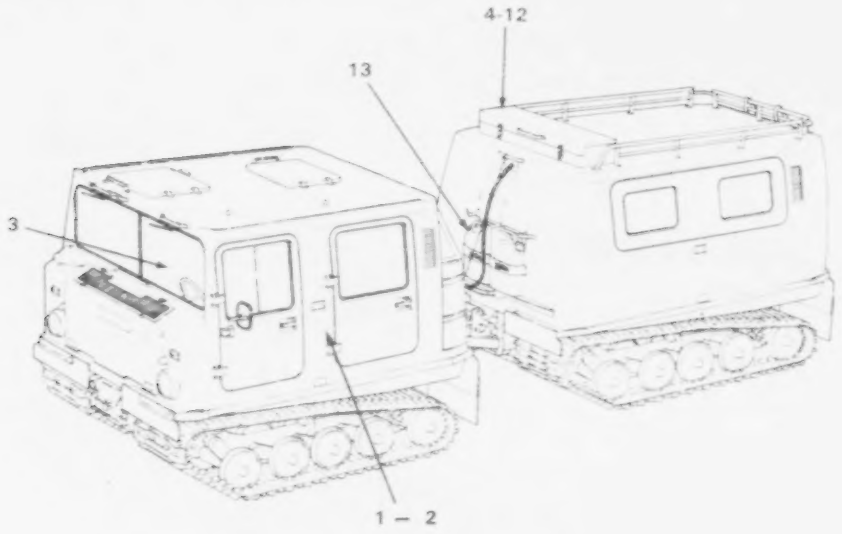
FRONT CAR, STOWAGE BOX
(1) BLOWTORCH, 1 LITRE, WITH PRESSURE GAUGE
(2) CASE, WITh SPARE LIGHT BULBS
(3) BANDS, ELASTIC
(4) TOOL ROLL
(5) OIL CAN
(6) GREASE GUN, COMPLETE
(7) FUEL CAN SPOUT
(8) EXTENSION LAMP, 10 m CABLE, WITH COVER
(9) ROPE, FIBROUS, 13.333 YD.
(10) REFLECTOR TRIANGLE WARNING KIT
(11) BLACKOUT LAMPS/BAG
(12) STOVE, COOK
(13) KIT, FIRST AID

FRONT CAR UNDER FRONT PASSENGER SEAT
(14) PLASTIC COVERS, FRONT AND REAR

FRONT CAR, BEHIND FRONT PASSENGER SEAT
(15) WINCH

REAR CAR
(16) FIRE EXTINGUISHER
(17) ENGINE HEATER AND ENGINE HEATER HOLDER (UNDER RIGHT SEAT)
(18) WINCH POWER AND REMOTE CONTROL CABLES (UNDER LEFT SEAT)
(19) BLOCK ASSEMBLY

Section III. EQUIPMENT STOWAGE LOCATION (CONTINUED)



TA259827

FRONT CAR
(1) FIRE EXTINGUISHER
(2) DECON APPARATUS
(3) LOG BOOK BAG

REAR CAR
(4) SUPPORTING PLATE, FOR JACK
(5) LIFTING JACK, 2.5 TONS
(6) SNOW SHOVEL
(7) SHOVEL
(8) TOW-LINE, 5 METERS
(9) CROWBAR
(10) AXE
(11) SHACKLES
(12) ADAPTERS
(13) FUEL CANS

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General, United States Army
Chief of Staff

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Major General, United States Army
The Adjutant General

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CHANGE ILLUSTRATION. REASON: TUBE END SHOWN ASSEMBLED ON WRONG SIDE OF LEVER CAM.

FIGURE 191, ITEM 3 HAS THE WRONG NSN. SUPPLY REJECTS ORDERS FOR THIS ITEM. THE NSN SHOWN HERE IS NOT LISTED IN THE AMDF OR THE MCRL.

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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Lb
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches
1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

TEMPERATURE

$5/9\,(^{0}F - 32) = {}^{0}C$
212^{0} Fahrenheit is equivalent to 100^{0} Celsius
90^{0} Fahrenheit is equivalent to 32.2^{0} Celsius
32^{0} Fahrenheit is equivalent to 0^{0} Celsius
$9/5\,C^{0} + 32 = F^{0}$

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621

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